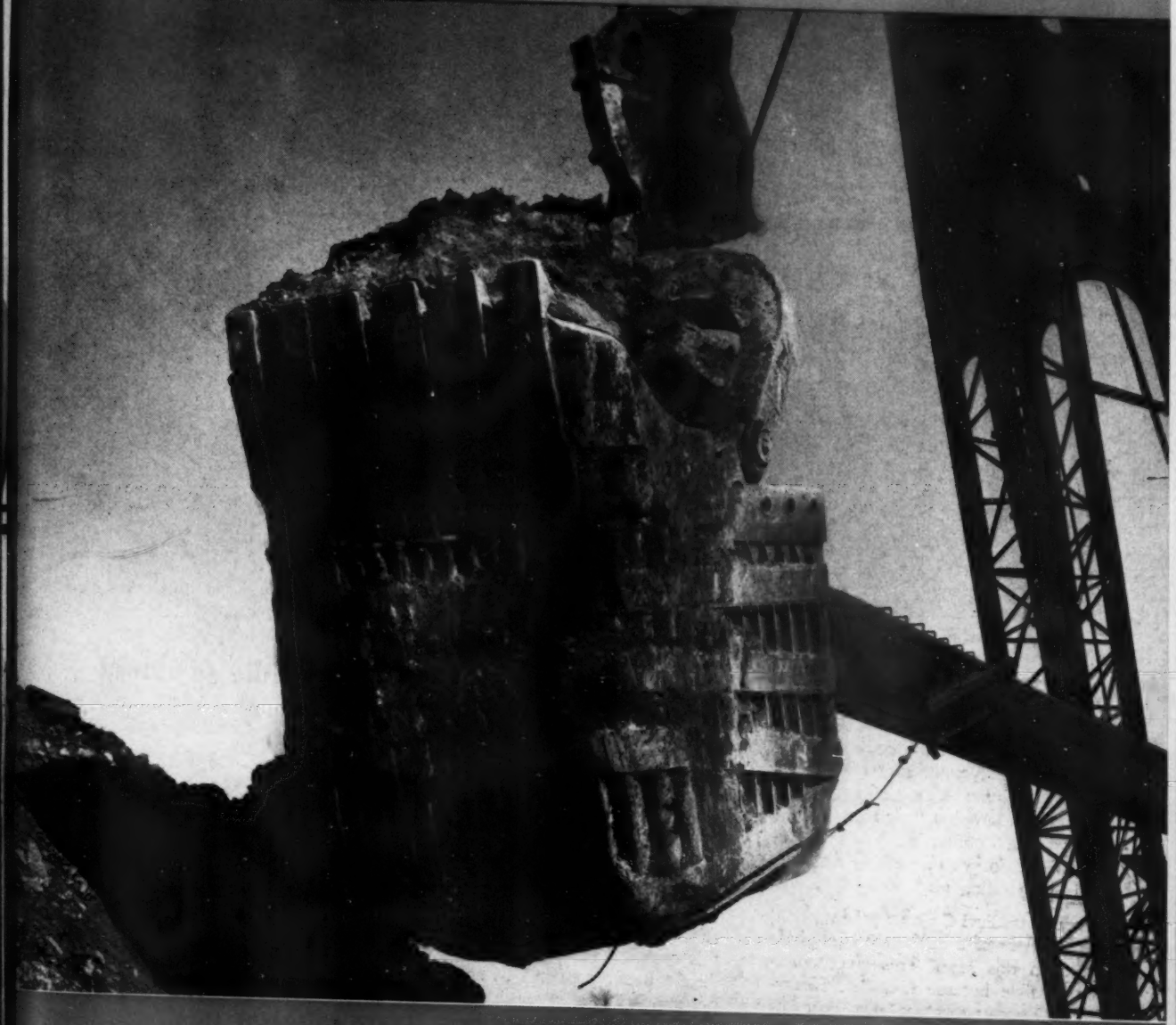
Mining CONGRESS JOURNAL

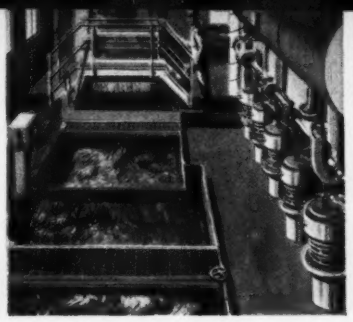
AMERICAN MINING CONGRESS

APRIL
1953

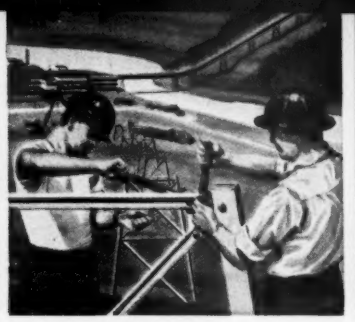


Cleveland, Ohio —**1953 COAL SHOW**— *May 11-14*

OVERALL ENGINEERING. Vast experience of nation-wide design and field engineering staff integrates all factors, assures expert planning.



QUALITY EQUIPMENT. Link-Belt builds broadest line—you get a range of choice in all items, most warantees from same source.



COMPLETE ERECTION. Experienced erection superintendents, staffs and skilled crews carry through entire job down to last detail.

SATISFACTORY PERFORMANCE. When you rely on Link-Belt as a single source, Link-Belt accepts responsibility for overall operation.

Why LINK-BELT can accept total responsibility for a complete coal preparation plant

Pocahontas Fuel Co. uses Link-Belt cleaning and handling equipment throughout preparation plant at Itmann, W. Va.

LINK-BELT Heavy-Media plant solves Pocahontas' cleaning problem

THE world-famous by-product coal of Pocahontas No. 3 Seam contains impurities in some areas. This cleaning problem was solved at their Itmann mine in Wyoming County, W. Va., by Pocahontas Fuel Co. with a Link-Belt Heavy-Media preparation plant.

Pocahontas Fuel Co. now produces 700 tons per hour of a uniformly high-grade coal from this seam. This is economically possible because Link-Belt Heavy-Media Concentrators separate materials at a low, economical specific gravity. Five clean, dry, accurate sizes are individually loaded or blended—and refuse disposed of by their Link-Belt engineered plant.

Link-Belt offers you unique advantages as a proved source of total responsibility in building coal preparation plants. Our engineers will be glad to show you how this complete service can help you produce a better product . . . at lower cost per ton.

LINK-BELT

COAL PREPARATION and HANDLING EQUIPMENT

LINK-BELT COMPANY: Chicago 9, Philadelphia 40, Pittsburgh 13, Wilkes-Barre, Huntington 9, W. Va., Louisville 2, Denver 2, Kansas City 8, Mo., Cleveland 15, Indianapolis 6, Detroit 4, Birmingham 3, St. Louis 1, Seattle 4, Toronto 8, Springs (South Africa). 19,024

SEE OUR EXHIBIT—COAL CONVENTION & EXPOSITION—CLEVELAND—MAY 11-14

BUCYRUS ERIE

HYDROCRANE

six ways better for so many mine jobs

Here the 3-ton, ½-yd. Hydrocrane cleans up around tipple track. Boom reaches out for extra passes — without moving crane an inch.

Only the Bucyrus-Erie Hydrocrane can offer you this combination of time-saving, cost-cutting features:

1. **"Reach-ability"** — Boom is equipped with 8 ft. hydraulically telescoping section that reaches into windows and doorways, box cars . . . across fences . . . excellent for placing conveyor machinery into shaft cages.
2. **Maneuverability** — Extremely short tail swing (about 4½ ft.), low overall height plus boom telescope permit maneuvering in close quarters that stop other outfits cold.
3. **Stability** — Four husky outriggers extend and retract hydraulically in seconds — permit levelling crane from operator's station — give Hydrocrane exceptional lifting capacity.
4. **Mobility** — Zips along open highways at speeds up to 50 mph — great for between-mines travel.
5. **"Control-ability"** — Fully hydraulic, for "hair line" precision control. Simple hand levers only — no foot brakes. Unskilled men have learned to run it in a few hours.
6. **Convertibility** — Crane has actually been converted to Hydrohoe front end *by one man in less than one hour!* On trenching, telescoping boom cuts lost time on moveup by 40 percent.

MINE-PROVED ON ALL THESE JOBS

- Load timbers to mine cars
- Clean out coal cars
- Erect and dismantle conveyor machinery
- Stockpile and rehandle sand, cinders, building materials
- Dig trenches, drainage ditches, foundations
- Unload mine tracks, pipe, motors, miscellaneous supplies
- Remove snow
- Clean up around tipple
- General utility work

WHEN YOU VISIT THE COAL SHOW...

. . . visit Booth 332 and see the Model 150-B electric shovel in operation.

Bucyrus-Erie Company
South Milwaukee, Wis.

BUCYRUS-ERIE COMPANY
South Milwaukee, Wis.

Gentlemen: ☐ Please send Hydrocrane literature.
☐ I would like a personal demonstration.

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Company.....

Address.....

City..... State.....

44H53

AT THE COAL SHOW

make it a point to

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for

NEW IDEAS and

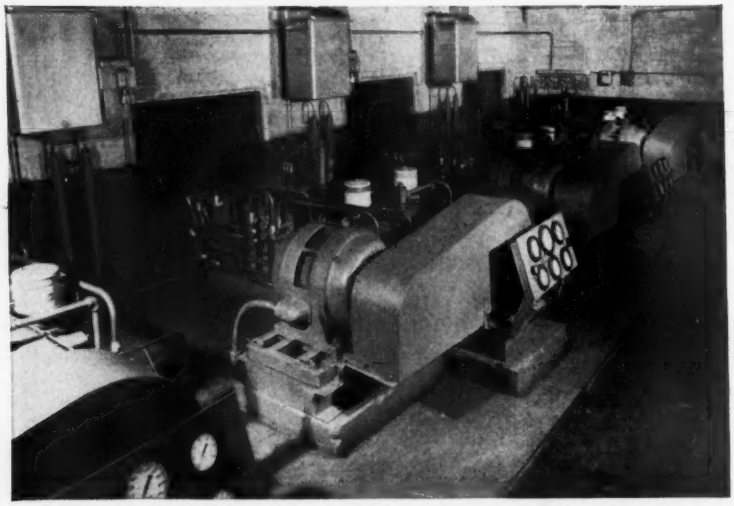
IMPROVED METHODS

Our engineers will be on hand to welcome you . . . to answer your questions on the methods and equipment you see here or on any other of our products. You'll come away with profitable ideas on ways and means to save money through lower operating costs!

CARDOX

AIRDOX

The Cheapest Means Known for Face Preparation



AIRDOX Compressors in a large mine—"Capacity" to break about 3000 tons every 8 hours.

There are three major reasons wh AIRDOX produces coal at low cost per ton than any other minin method.

- In practically every case, th actual cost of dislodging is le with AIRDOX.
- The manner in which AIRDO dislodges the coal materially i creases its loadability.
- Cleaning costs are reduce because of the comparative lower percentage of fines.

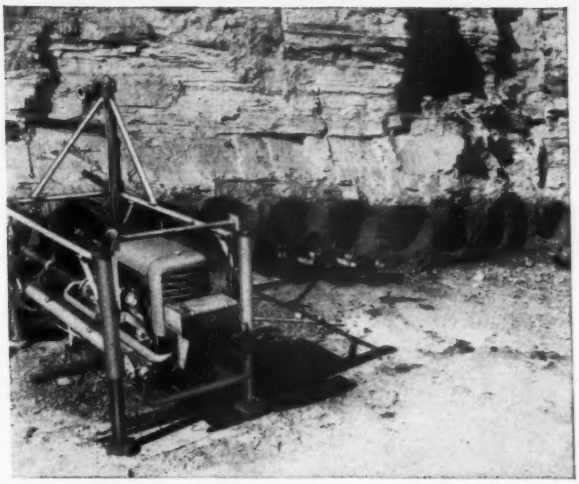
In addition AIRDOX provid greater safety to men, better p tection to roof structure. It understandable that more a more mines are turning to th non-explosive mining meth using compressed air to increase profit spread of their operatio Get the facts at the Coal Sho or write for further information.

CARDOX

Surface AUGER MINER

drills under the overburden— turns abandoned coal into high-profit tonnage

When excessive overburden makes conventional stripping unprofitable, a CARDOX Surface AugerMiner enables you to bore back into the seam as much as 100 to 120 feet from the face. Driven by a rugged 145 H. P. engine, augers up to 36 inches in diameter, drill out pure, clean coal, ready for mechanical loading. Auger lengths in 6 foot sections are easily added or removed by the built-in retriever. Directional control and hydraulic positioning keep the auger drilling into the best part of the seam, away from rock and shale. Units can be towed or trucked easily.



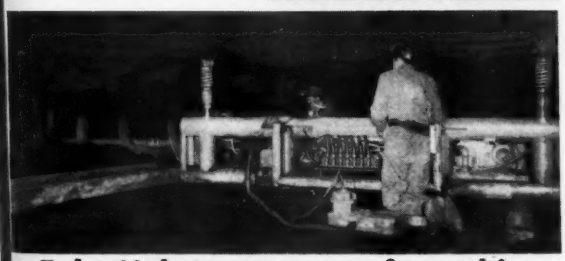
Because there is little or no development cost, CARDOX AugerMiners salvage coal at a cost usually far less than for the original working.

NON-EXPLOSIVE MINING METHODS and DRILLING EQUIPMENT

NEW HIGH-CAPACITY

CARDOX

Underground AUGER MINER



Take Volume tonnage from thin seam or poor roof areas

Stepped-up power insures excellent volume at low-per-ton cost where thin seams or poor roof areas make conventional mining unprofitable or unsafe. Every ton recovered is "bonus" tonnage you'd otherwise lose. Directional control keeps the auger out of impurites from roof or bottom. Operators never have to leave safe areas! Perfectly adapted to mechanized loading. Ask about this unit at the COAL SHOW, or write for more information.

CARDOX-HARDSOCG

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For fast, easy drilling of blast holes— at low cost per hole

Simple, rugged and very easy to use. The weight of the engine forces the auger and cutterhead into the material being drilled. Large hand wheel raises and lowers the power assembly easily. Mast can be lowered when moving unit. Available with 6½ H. P. or 12 H. P. air-cooled gasoline engine. Standard auger equipment includes 6 foot section for 2½" or 3" holes. Other sizes also available.

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MARION *invites you to the*

COAL SHOW

In Cleveland, May 11-14

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You'll see old friends, make new ones, hear experts in every phase of the industry and have time to enjoy a little relaxation away from your day-to-day routine.

Come to Cleveland—see the exhibits —hear the programs—and get yourself set for the big things ahead.

1 CLEVELAND AUDITORIUM
where Coal Show sessions and displays are located.

2 HOTEL STATLER
Euclid at East 12th—Club Room 345 at the Statler will be Marion Power Shovel Company Headquarters for the Coal Show.

See your MARION friends in Cleveland

Make it a point to see your friends from Marion Power Shovel Company at the Coal Show.

MARION will have an exhibit in Booth 1003 in the Cleveland Auditorium.

Marion Power Shovel Company headquarters for the Coal Show will be in Club Room 345 in Hotel Statler. We'll be looking for you.

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MARION, OHIO, U. S. A.

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Opinions expressed by authors within these pages are their own, and do not necessarily represent those of the American Mining Congress

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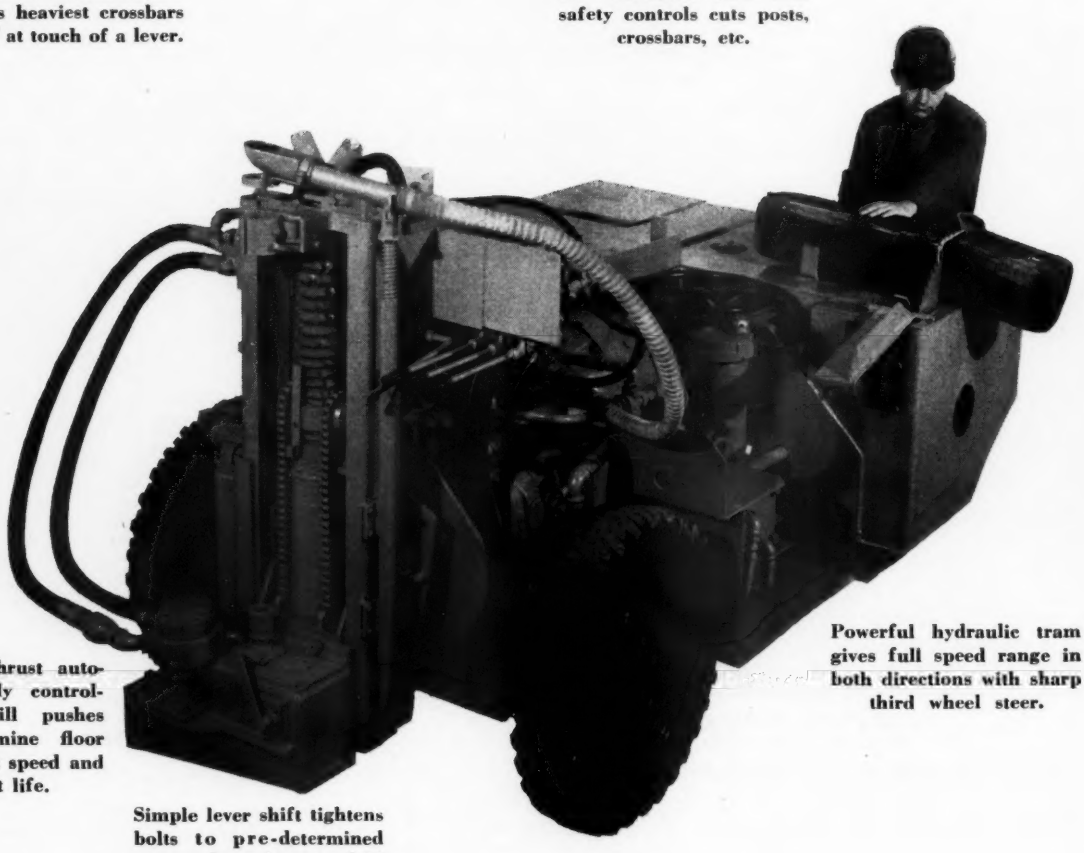
24" Circular Saw with safety controls cuts posts, crossbars, etc.



High-thrust automatically controlled drill pushes from mine floor for best speed and bit life.

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FLETCHER ROOF CONTROL DRILLS have been the first to incorporate the features most wanted by the Mining Industry. It's no wonder they are used where drilling is hardest and production is highest. Now, with the optional addition of timbering attachments you can buy a *complete* Roof Control unit to handle your toughest problems. You'll still have the wonderfully rugged, high capacity Fletcher Drill, but with added flexibility. There are Fletcher Roof Control Drills in mines near you. Why not put them in yours?

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"Euc" bodies have extra thick plates reinforced with heavy box section side and bottom supports. The rugged frames are built to withstand the impacts of hauling and dumping big loads . . . they're built to take the pounding and wear of loading earth, rock and other heavy excavation by large shovels and draglines.

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The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

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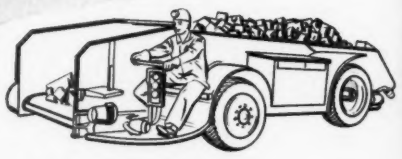
★ **20% more capacity in the same space**

★ **Lowest cost per A.H. to own and operate**



Heavier demands on all types of battery-powered haulage equipment dictate the need for batteries with greater capacity.

The new Exide-Ironclad T-H battery gives 20% more capacity in the same space—WITHOUT SACRIFICE OF LONG LIFE for which Exide-Ironclad Batteries are famous.

This new T-H battery is of the time-tested Exide-Ironclad construction, employing the exclusive slotted tube positive plate. New materials have made structural changes possible, which permit the use of larger positive plates—resulting in increased capacity.

The T-H line of Exide-Ironclad Batteries includes capacities for all battery-powered haulage units.

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May 11-14—Cleveland
Spaces 240-41-42

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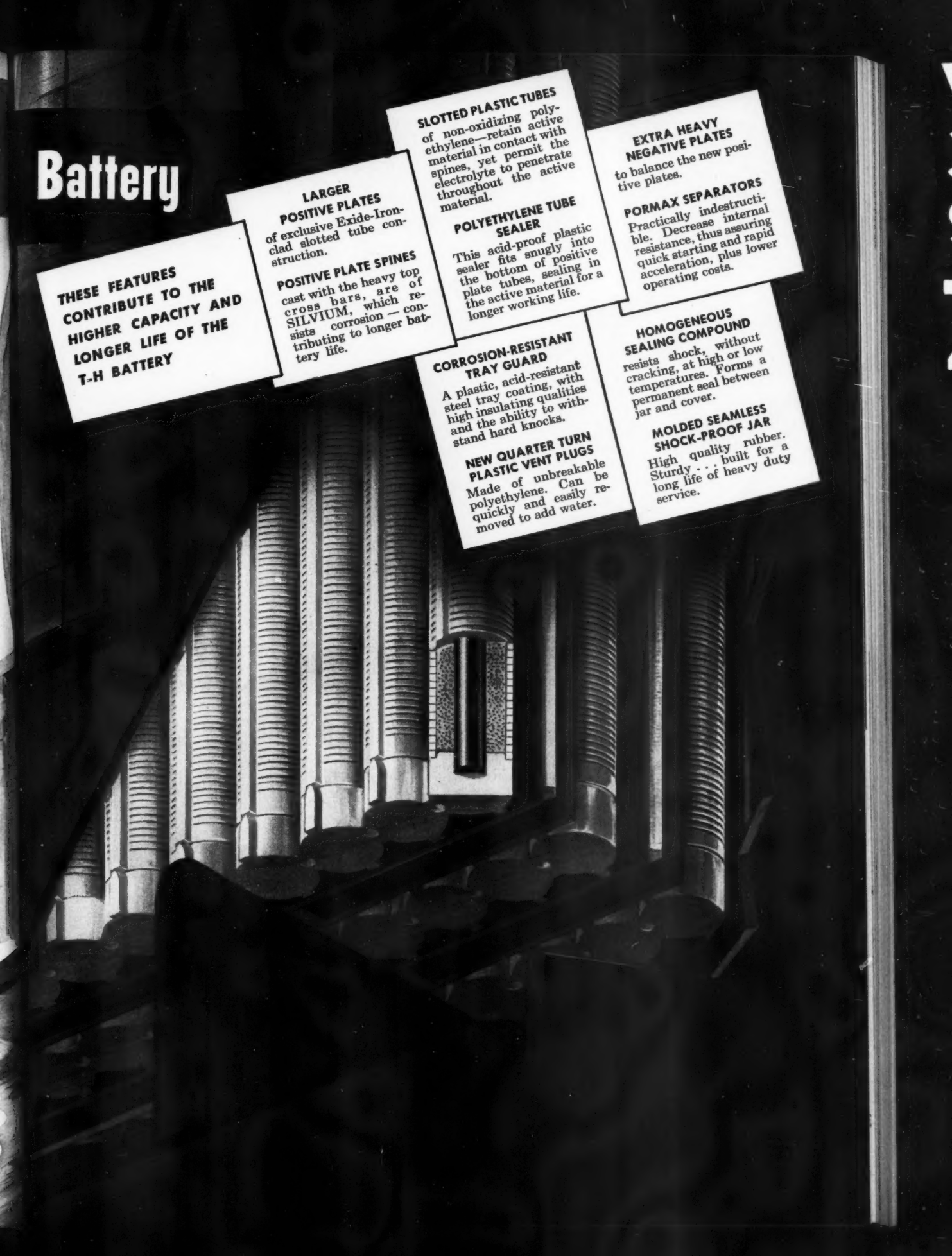
Battery



THESE FEATURES CONTRIBUTE TO THE HIGHER CAPACITY AND LONGER LIFE OF THE T-H BATTERY

LARGER POSITIVE PLATES
of exclusive Exide-Ironclad slotted tube construction.

POSITIVE PLATE SPINES
cast with the heavy top cross bars, are of SILVIUM, which resists corrosion — contributing to longer battery life.

SLOTTED PLASTIC TUBES
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This acid-proof plastic sealer fits snugly into the bottom of positive plate tubes, sealing in the active material for a longer working life.

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to balance the new positive plates.

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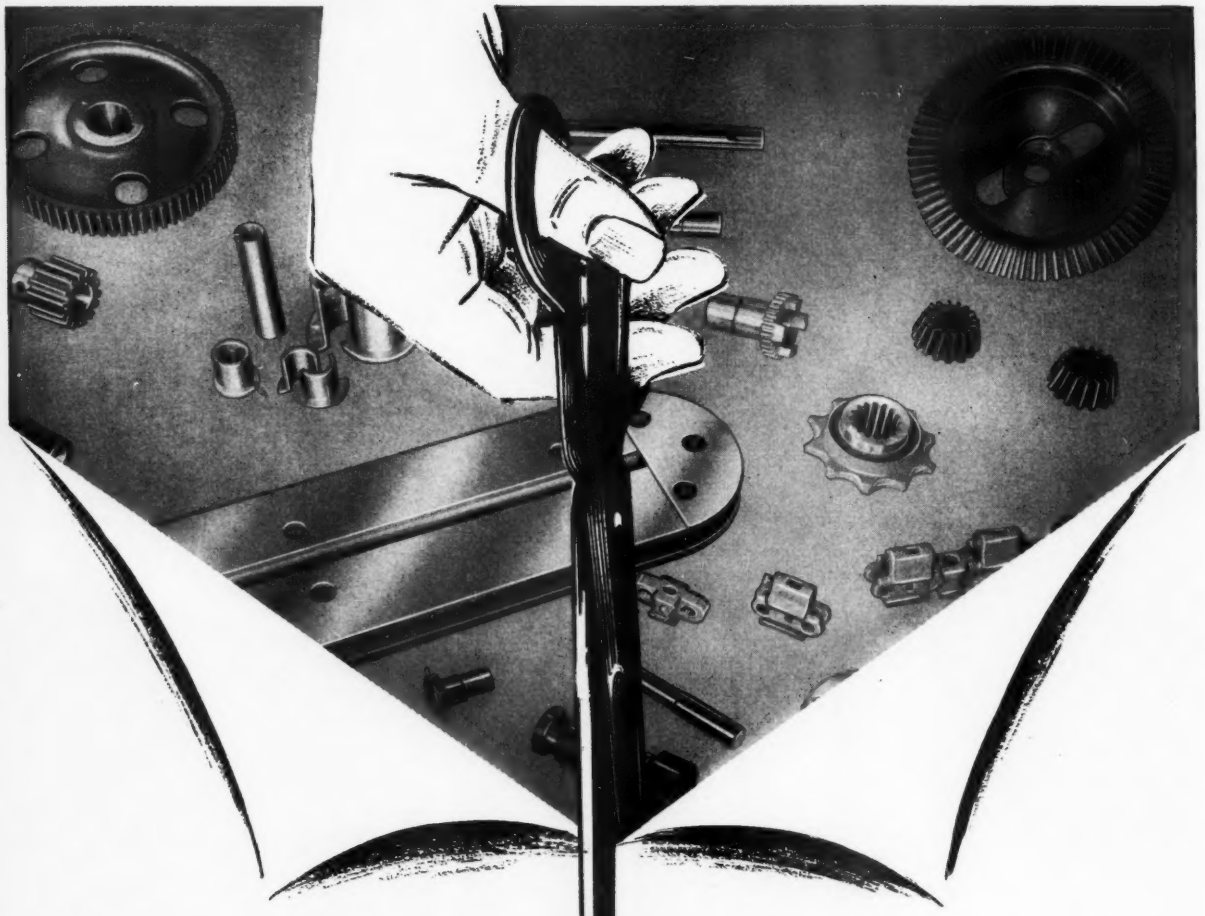
MOLDED SEAMLESS SHOCK-PROOF JAR
High quality rubber. Sturdy . . . built for a long life of heavy duty service.



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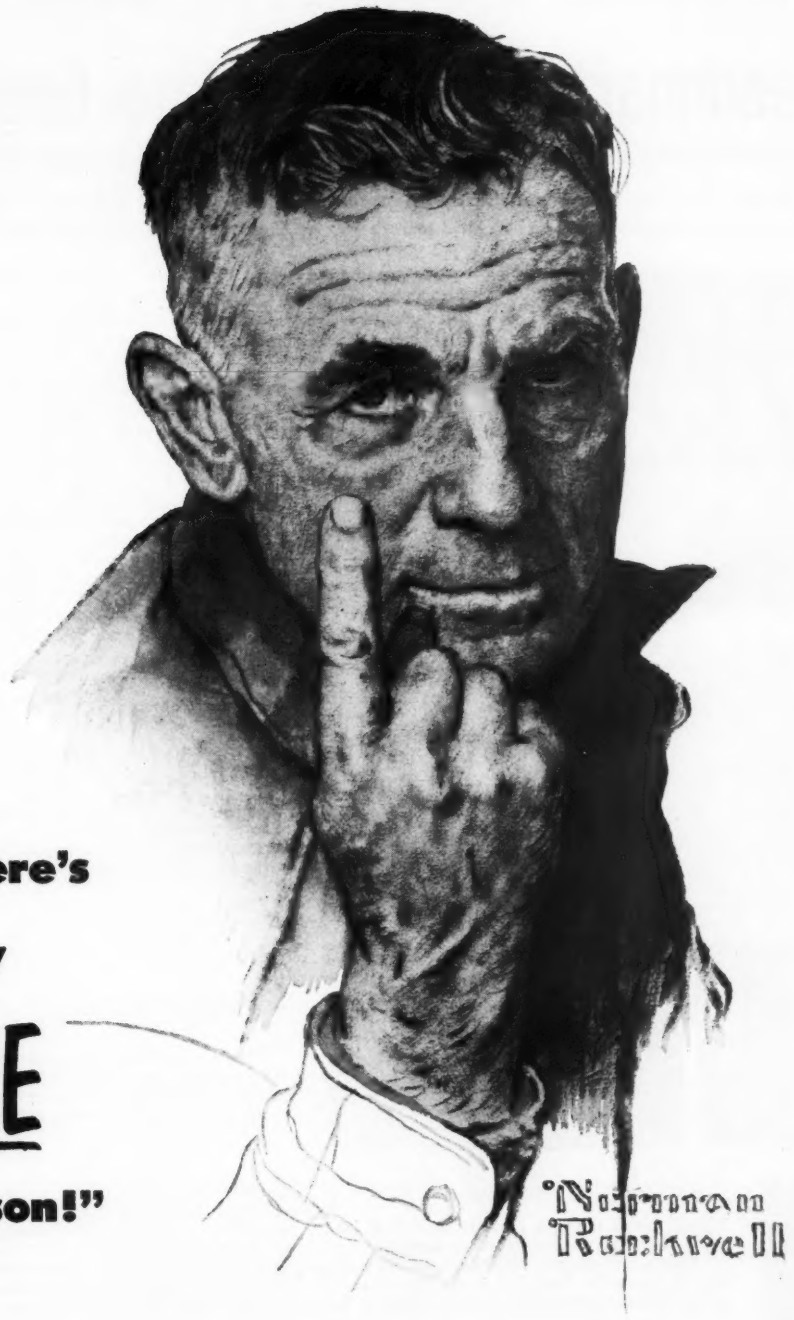

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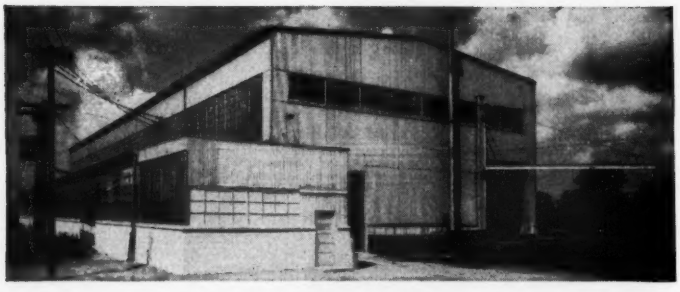

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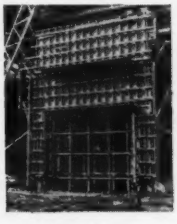

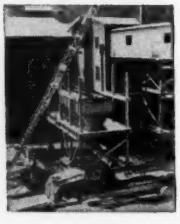

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R & S has long been known as headquarters for complete, functional coal preparation plants of all sizes and descriptions—whether of steel, concrete or timber construction.

Test before you invest!

This modern R & S pilot preparation plant lets you take the guess-work out of coal cleaning. Using a full carload sample, with full size equipment, under actual operating conditions, it shows exactly what R & S equipment can do for your coal product. At the end of the process all end products are analyzed by an outside, unbiased laboratory, Commercial Testing and Engineering Co. You get their full report in writing, plus the recommendations of R & S coal preparation specialists. The full story is told in a new bulletin. Write for your free copy.

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As always, the R & S booth will have a full time staff of R & S engineers to help you with your coal preparation and handling problems . . . to make your visit to the Coal Show as profitable as possible.

For your added profit, pleasure and convenience, R & S also invites you to take advantage of the other R & S booth services and facilities described here.

SECRETARIAL SERVICE

If you have to dash off a quick letter to your office, or any place else during the course of the Coal Show, chances are you can get exactly the kind of help you need at the R & S booth.

PLAN TO "HANG YOUR HAT" (literally) AT R & S SERVICE HEADQUARTERS

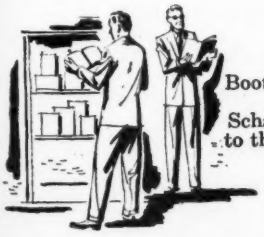
While space, hangers and racks last, we shall be happy to have you use the cloak-room facilities of the R & S service booth.

WHERE'S THE PHONE? AT BOOTH 2000, OF COURSE!

"Where's the telephone?" is usually a problem at trade shows and conventions. However, the 1953 Coal Show will be an exception. Feel free to use the telephone facilities provided at R & S booth 2000, "at the top of the stairs."

REST AND READ . . . OR VISIT

The central location of R & S booth 2000, "at the top of the stairs," makes it a good central point for starting out or ending up, for meeting friends, or for just plain relaxing in a soft, comfortable easy chair.



UP-TO-DATE DATA ON R & S EQUIPMENT AND SERVICES

Booth 2000 will have ample stocks of all up-to-date Roberts and Schaefer Co. literature. Your visit to the booth will be a good chance to bring your R & S literature file up to date.

AND "COFFEE-AND"

It's always "coffee-and" time at R & S Coal Show Service Headquarters "at the top of the stairs." We hope you will plan to stop and have a cup of coffee with us while you are at the Show. We will enjoy seeing you and we believe you will enjoy the "coffee-and."

We look forward to seeing you at the Cleveland Coal Show May 11-14, 1953

"AT THE TOP OF THE STAIRS"

ROBERTS and SCHAEFER CO.

BOOTH 2000

PHOTO BY A. DEVANEY INC.

HEADQUARTERS FOR EXPLOSIVES

Hercules Powder Company welcomes all visitors to the American Mining Congress 1953 Coal Convention and Exposition, May 11-14, Cleveland Public Auditorium. Drop in to see us at Booth No. 1421, in the Arcade, and learn the latest about Hercules' complete line of explosives and blasting supplies for coal stripping and underground use. If you cannot make the Show, do the next best thing — write for a copy of "Hercules Explosives and Blasting Supplies."

Explosives Department

HERCULES POWDER COMPANY

INCORPORATED

922 King St., Wilmington 99, Del.

XR53-2

This kind of OVERHEAD Lets Trips Move FAST!

....it's straight, level and smooth

Fittings for use on pipe for overhead supports like this are shown in the O-B No. 27 Catalog. Check it for materials used on wood, steel, or roof, also.

Current collectors skim smoothly along a trolley wire like the one shown above! They hug a wire that's level and straight, and motormen know they can move fast when collectors act that way. You can have this kind of overhead-easily-throughout your haulage system; inside and out. With O-B Trolley and Feeder Materials, you can build it on any kind of support structure - on pipe, on timbering or on I-beams, or fasten it right to the roof. O-B hangers, adapters, and expansion bolts for use on all these supports let you hang O-B Smooth Underrun Trolley Materials wherever track is laid.

"Straight, level and smooth" describes the overhead you want for fast haulage. Build it anywhere with O-B Smooth Underrun Trolley Materials.

Ohio Brass

4340-M

My Sweetheart's No Longer "A Mule in The Mine"...

IT'S THE RELIANCE TYPE 'T' HEAVY DUTY

"The Toughest Motor Ever Built!"

Reliance Totally-enclosed, Non-ventilated, Explosion-proof Motor; one of several Reliance motor types especially developed for the mining industry. Reliance Type 'T' Motors are available in ratings from ¾ to 100 hp. to meet standards of the Bureau of Mines for use on "permissible" equipment. Low height and compact design satisfy space limitations of underground applications.

See
Precision Balancing of Rotors
...building longer life into
Reliance Motors
BOOTHS 1900-2001
CLEVELAND COAL SHOW
MAY 11-14

Write for Bulletin C-2001 describing the complete line of Reliance Type 'T' Motors through 1000 hp.

Wise operators nowadays provide their miners with dependable, economical Reliance Type 'T' Heavy Duty Motors. These rugged motors power 95% of all rubber-tired underground haulage . . . 70% of all coal loaders . . . and increasing numbers of other underground machines performing the toughest jobs in mining.

Type 'T' motors embody refinements developed by Reliance engineers working closely with users in the application of thousands of motors to the coal-mining industry. Especially designed, electrically and mechanically, for difficult underground jobs, Reliance motors have vital parts thoroughly protected against coal dust, moisture and other hazards encountered in the toughest mining jobs. They *stay* clean and dry...last longer with less maintenance.

The next time you order new equipment, specify Reliance. See for yourself how these *tough* motors keep production up . . . and costs down. C-1446-A

RELIANCE ELECTRIC AND ENGINEERING CO.

1116 Ivanhoe Road, Cleveland 10, Ohio • *Sales Representatives in Principal Cities*

Now available!
Superior insulation featured in new Cyanamid blasting caps

AMERICAN CYANAMID COMPANY
EXPLOSIVES

Cyanamid has for many years been conducting a study of all materials available for blasting cap wire insulation to find one that would offer uniform concentricity—no thin spots. Every type of insulation currently in use has been tested, as have many new materials. Now Cyanamid has an insulation that gives *uniform concentricity*, assures maximum performance!

This new, organisol plastic insulation is applied to wire by a continuous bath method. The wire is dipped in *seven separate baths* and is passed through dies to scrape off excess coating between baths.

Color-Coded for Easy, Sure Identification

stantaneous, copper wire | Instantaneous, iron wire | Standard Delay | Split Second Delay

Each coat is heated to insure perfect set, perfect concentricity. Organisol plastic insulation, because of its uniformity, gives you:

1. **Greater electrical insulation values**
2. **Greater flexibility**
3. **Greater abrasion resistance**
4. **Non-porosity**
5. **Greater moisture resistance**

Capable Field Engineers Are Available At Your Call

HIGH EXPLOSIVES • PERMISSIBLES • BLASTING POWDER
BLASTING ACCESSORIES

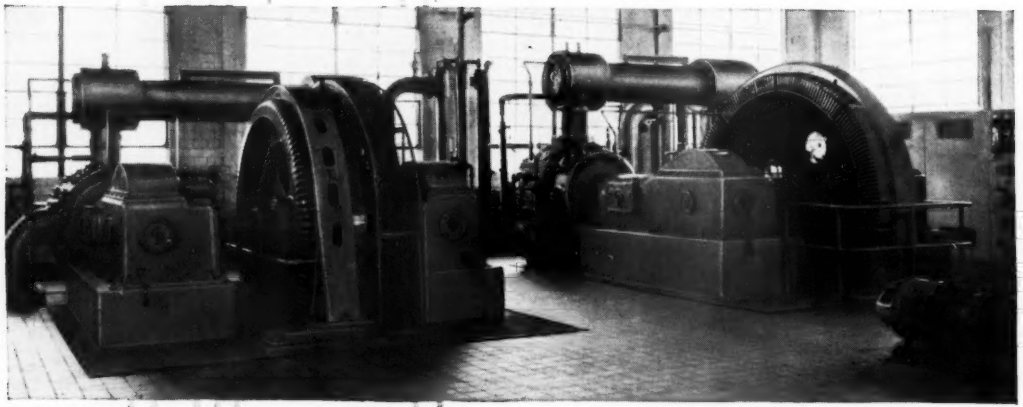
AMERICAN Cyanamid COMPANY

EXPLOSIVES DEPARTMENT
30 Rockefeller Plaza, New York 20, N. Y.

Sales Offices: Pittsburgh, Pa.; Bluefield, W. Va.; Scranton, Pa.; Chicago, Ill.; Pottsville, Pa.; Maynard, Mass.

NO CLOCK PUNCHING

for these compressors



That's right! There's no daily time limit placed on the work output of Chicago Pneumatic Class O-CE Compressors . . . they operate "around the clock" with a minimum of attention. Designed for continuous, year-in, year-out heavy industrial usage, these units are unsurpassed for a dependable air power supply at low cost. Built in sizes up to 2,000 hp, for pressures up to 5,000 lbs., they are available in horizontal, two-stage, water-cooled types with direct-mounted synchronous motor drive.

The Chicago Pneumatic Class O-CE Compressor is equipped with roller bearings, Simplate valves for low power consumption, streamlined air passages to cut down air flow resistance, CP Multi-Step Control for partial load economy, and a CP Intercooler for maximum heat transfer and low water consumption. Ask for Bulletin 726. *Chicago Pneumatic Tool Company, 8 East 44th Street, N. Y. 17, N. Y.*

Chicago Pneumatic

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

Keep Your Mechanical Equipment *on-the-Move*

With Rome 60 Mining Cables

Open braid firmly interlocks conductor to tough, all resistant Neoprene sheath . . . prevents loosening and sheath separation from twisting, bending, pulling.

Grounding conductor is solidly embedded in Neoprene. This integrated construction provides exceptional protection against "shorts" and mechanical injury . . . maintains flexibility and reduces conductor distortion and fatigue.

Did you ever stop to figure the cost of mining cable failure? . . . the cost in tonnage losses, in man hours wasted, in expensive equipment standing idle? *It's always many times the cost of the cable itself.* That's why we say "It Costs Less to Buy the Best," Rome 60 Mining Cables.

INTERLOCKED CONSTRUCTION—Take a good look at the Parallel Duplex Shuttle Car Cable, illustrated at the left. Note how the open braid around each conductor firmly interlocks . . . actually "gears" it to the Neoprene sheath. This prevents failure from twisting, pulling and sheath separation. As an extra feature, the heat-resistant rubber insulation offers exceptional overload protection—is suitable for operation at 75° C.

MAXIMUM FLEXIBILITY—Now, see how the grounding conductor is separated from the insulated conductors by a tough, highly resilient Neoprene webbing. Result? . . . Maximum flexibility, high resistance to impact, less conductor fatigue, as well as increased protection against "shorts." There are no fibrous "separators" to rot, deteriorate or wick moisture.

ALL-RESISTANT NEOPRENE SHEATH—And now a glance at the Neoprene sheath . . . Molded in lead to a tire-like toughness, it is highly resistant to acids, oils, abrasion and flame. P-105BM molded in the Neoprene sheath is your assurance of compliance with Federal and Pennsylvania Safety Codes. Depend on Rome 60 Mining Cables to keep the power flowing in—and coal flowing out.

See us at the Coal Show
Booth 1205 in the Arcade
Public Auditorium, Cleveland
May 11-14

It Costs Less to Buy the Best

Rome 60 Line Includes: Type SO Portable Cords • Single Conductor Locomotive Cables • Concentric Mining Machine Cables • Twin (Parallel Duplex) Mining Machine Cables—Types W and G • Multiple Conductor Portable Power Cables—Types W and G • Shot Firing Cord • Mine Power Distribution Cable • Shovel and Dredge Cables

ROME CABLE
Corporation
ROME • NEW YORK
and
TORRANCE • CALIFORNIA

ROME CABLE ROME, N.Y.

INTEGRATED

Allis-Chalmers vibrating screens are available in three basic types in a complete size range with modifications of each type. Applications include sizing dry or moist coal, dewatering, sink-float, heavy media pre-wetting and recovery, sludge screening.

Thermo-Deck, Texrope and *Vari-Pitch* are Allis-Chalmers trademarks.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

equipment...

IMPROVES COAL QUALITY
CUTS PROCESSING COSTS
INCREASES TONNAGE!

Upgrading coal to meet the requirements of today's big markets in metallurgical, chemical and power industries calls for the coordination of equipment best suited for each processing operation. Only through the teamwork of integrated equipment can you get these benefits:

- **Maximum efficiency of men and machines.**
- **Important processing economies.**
- **Big production increases.**

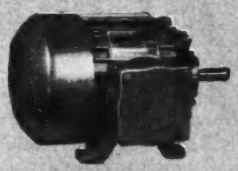
Largest of any manufacturer in range of industrial equipment, Allis-Chalmers offers a broad choice of equipment types and sizes. This means that Allis-Chalmers can make a truly *unbiased* recommendation for each job. It also means coordinated research and engineering and the right-for-the-job integration of machine, motor, drive and control . . . integration that produces more and better coal . . . integration that affords the obvious advantages of total responsibility for overall operation.

Allis-Chalmers field engineers are equipment application specialists. They work with your staff . . . appraise your equipment needs expertly. For the complete profit-building story of integrated equipment, call on your nearby A-C representative or write for Bulletin 25B-6280D. Allis-Chalmers, Milwaukee 1, Wis.

A-4036

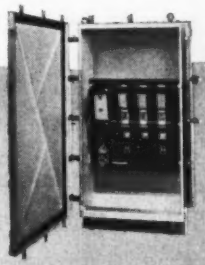
MACHINE–MOTOR–DRIVE–CONTROL

THE CW SOLIDS HANDLING PUMP — Especially designed for coal washing. Handles up to 40% solids in suspension in slurries, tailings and sludges. Only five easily removed working parts. Capacities from 175 to 10,000 gpm; heads to 150 feet.



MOTORS — Allis-Chalmers builds a complete line of polyphase squirrel cage, wound rotor and synchronous motors with electrical and mechanical modifications to meet any application.

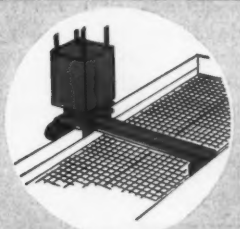
***TEXROPE* DRIVE — *Vari-Pitch* standard sheave.** One sheave does the job of two or three. Speed range of 9% to 28% on drives of 1 to 300 hp. Two to ten grooves. Available in either motion or stationary control.



CONTROL — Includes full and reduced voltage starters for all type motors from fractional to 2500 hp, operating on voltage from 110 to 5000. Starters are available in general and special purpose enclosures.

TRANSFORMERS— Simple design, substantial construction and care in manufacture all contribute to excellent, long term "on-the-line" performance with minimum maintenance. A-C makes transformers of all types for indoor and outdoor installation.

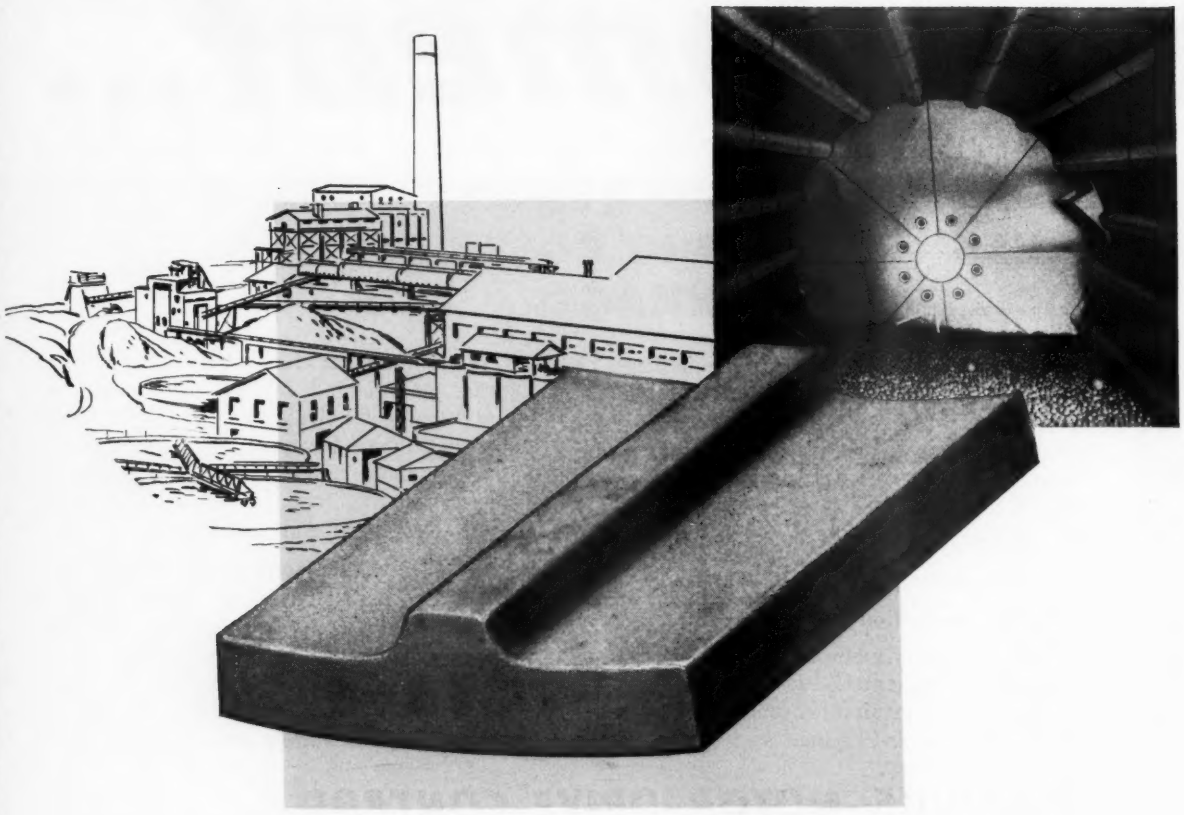
CAR SHAKER — Unloads gondola cars in as little as two minutes. Simple vibrating mechanism is eccentric shaft mounted on large bearings and driven by a 15 hp motor and Texrope drive inside shaker body.



***THERMO-DECK* Heating Unit —** Low voltage resistance heating of wire cloth eliminates troublesome blinding of moist fine coal. Can be installed on any A-C screen.

Allis-Chalmers is one of the few companies in the world that can equip your plant with the basic machinery plus power, electrical and control equipment needed to operate it — *integrated equipment from a single source backed by complete responsibility.*

See the ALLIS-CHALMERS Integrated Line at the Coal Show. May 11-14, Public Auditorium, Cleveland, Ohio



this LINER boosted production 35%

AMSCO Ball Mill Liners

Reduced Down-Time, Increased Production...

A large West Coast cement producer found that Ball Mill Liners were causing expensive trouble. Liners were thick—*over 3 inches.* This meant reduction in mill capacity. Thick liners also meant tremendous weight. Both thickness and weight reduced production and efficiency. *Liners wore rapidly,* too, causing frequent, expensive replacement jobs, with costly labor and material. And added to the bill was lost production due to mill down-time.

Well-known for their skill in handling impact and abrasion-resistant alloys, AMSCO engineers and foundrymen were consulted.

AMSCO solved the Ball Mill Liner problem.

AMSCO designed a new, light, thin—*1 inch thick* —liner, which because of lightness and thinness increased mill capacity, heightened efficiency. The new liners lasted beyond all expectations and in addition the segments were easier to install. These factors, plus reduced replacement down-time, have been responsible for a *35% increase in production.*

AMSCO is the largest producer of Manganese Steel, "the toughest steel known," which has proven itself under countless abrasion and impact situations. And where the service conditions require it, AMSCO also produces Chromium-Molybdenum and Chrome-Manganese alloys.

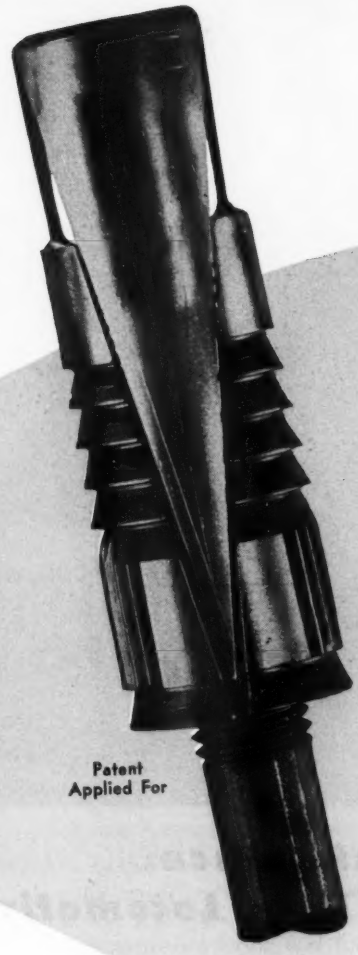
If you have a tough wear problem and suspect that there may be a better alloy for your purpose, you are invited to write to AMSCO for further information.

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION

422 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Foundries at Chicago Heights, Ill.; New Castle, Del.; Denver, Colo.; St. Louis, Mo.; Los Angeles, Calif.
Offices in principal cities. In Canada: Joliette Steel Limited, Joliette, Quebec.



Patent Applied For

"YOUR NEW SHELL IS THE ONE THAT DOES THE JOB" *say*

Operators with Soft Roof Mines

After rigid tests by mining companies of various types and makes of roof bolts—both split and shell type—sizeable installations of the new PATTIN expansion shell were made in a number of mines having soft roof conditions and the results of their tests and studies proved that the PATTIN shell anchors equally well in a hard or soft roof. Now, many mines working under a soft roof have standardized on the PATTIN shell and benefit from a safer roof, fewer accidents, more clearance for machine operation, increased production and better ventilation.

For a safer roof—hard or soft—the new PATTIN shell having double the usual shell expansion plus a 3-inch parallel contact with the hole wall provides the strongest known anchorage for roof bots. They are easy to install as no definite drilling depth is required and the shell can be anchored any place in the hole without turning while being tightened. There's no loss of parts in handling as the shell and wedge are locked together and no special nuts or ears are needed for the bolts.

PATTIN *"The Pioneer in Roof Bolting"*

and at the COAL SHOW—

Every model of PATTIN'S roof bolts—split and shell type—will be on display and available for inspection in space 624 (Main Exhibit Hall). Make it a point to see the new expansion shell that has captured all roof bolting records.

PATTIN MANUFACTURING COMPANY

"65th Year"

MARIETTA, OHIO

National Coils, National Maintenance Put Extra Performance into Mine Locomotives

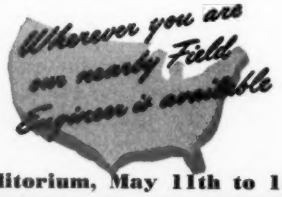
The National Electric Coil Company "grew up" in the coal fields. Knows the problems which mine operators face; maintains two plants located and equipped specifically for mine service, and a third which contributes directly to speed and quality of our work for mines.

In these modern, completely equipped plants, specialists in *your* kind of motive power problems can do *everything* it takes to keep your mine locomotives running. Whether it's tire-tread rebuilding or complete locomotive overhaul, National can do it. If you need replacement coils, National is your best source.

National shop practices stress the little things which mean *extra-long life, extra-rugged performance.* National standards of quality and National engineering "know-how" mean that the motor you send in for rewinding or rebuilding will come back as good as new, or *better.*

Fast pick-up service by National's own truck fleet helps you get out-of-service units back to work with minimum loss of time.

Your National field engineer knows your problems, he's there to help you keep your locomotives running. If you don't know him, drop a line to the nearest National plant —Harlan, Kentucky; Bluefield, West Virginia; or Columbus, Ohio.



See our Exhibit at the Coal Show, Booth 2338, Cleveland Auditorium, May 11th to 14th.

NATIONAL ELECTRIC COIL COMPANY

COLUMBUS 16, OHIO, U. S. A.

ELECTRICAL ENGINEERS: MAKERS OF ELECTRICAL COILS AND INSULATION— REDESIGNING AND REPAIRING OF ROTATING ELECTRICAL MACHINES

LOADING IN LOW COAL CAN BE PROFITABLE

When You Put the Goodman Type 865 Loader on The Job

20475

IT'S LOW Over-all height is only 26½", coal line height 17½".

IT HAS SIDE SWING-MOTION Both loading head and discharge end swing 40° to either side for wide face room work with minimum maneuvering and for pillar recovery without loss of time or tonnage.

IT HAS VERTICAL SWING-MOTION Both loading head and discharge end can be raised or lowered to suit loading conditions . . . to suit transportation equipment.

IT HAS CAPACITY 8-tons per minute in free loading coal.

IT'S FAST With at least one of the gathering arms always under the coal, loading is continuous; machine is not subject to strain or shock.

IT HAS POWER Two 10 hp. motors for tramming and hydraulic pumps; two 20 hp. motors for gathering and conveying.

IT'S SAFE AND EASY TO OPERATE Smooth, positive movements through full hydraulic control; operator can always be under supported top and away from rib.

IT'S RUGGED All parts feature strength and precision construction for long life; maintenance cost is low.

ASK FOR A COPY OF DESCRIPTIVE CATALOG CLT-521

OTHER GOODMAN SWING-MOTION LOADERS:

Type 665	Type 666	Type 660
Over-all ht. 43"	Over-all ht. 36½"	Over-all ht. 33"

The Type 865 Loader and other new Goodman mining machinery will be shown at the Cleveland Coal Show May 11-14. You are cordially invited to make a first-hand inspection.

Goodman
MANUFACTURING COMPANY
4834 S. Halsted Street • Chicago 9, Illinois

Cutting Machines · Conveyors · Loaders · Shuttle Cars · Locomotives · Continuous Miners

FOR *MAXIMUM SAFETY*

IN MINE ROOF SUPPORT

PITTSBURGH PIT-BOLTS

SEE THEM! BOOTH 736
at the COAL SHOW

Produced by one of the world's largest bolt, nut and rivet manufacturers—equipped with the experience and modern facilities to provide roof bolts of highest quality and dependability—"Pit-Bolts" make mine roofs safer, faster, at minimum cost.

"Pit-Bolts" are furnished in either *Expansion Units* or *Split Rods* as illustrated. *Expansion Unit* bolts are $\frac{3}{4}$" diameter with special square head (not chamfered) for greatest efficiency when used with power wrenches. Recommended diameter of *Split Rods* is one inch. Both type bolts are furnished in any desired lengths. Threads are treated with rust resistant.

BOLT LENGTH ON HEAD FOR QUICK IDENTIFICATION

The heads of *Expansion Unit* bolts are legibly marked as to length for quick, accurate selection of the correct length when bolts are installed. Write today for "Pit-Bolt" Bulletin!

PITTSBURGH SCREW AND BOLT CORPORATION

2800 PREBLE AVENUE • PITTSBURGH 12, PA.

Representatives in Principal Cities

For Prompt Deliveries, Always Specify . . .

PITTSBURGH PIT-BOLTS

Kennametal Bits
Cut 10 times more places per bit life

at Vinton Coal and Coke Co.

POWER SAVED
Use of Kennametal Cutter Bits has reduced power consumption by as much as 30% to 50% in typical Penna. and W.Va. mines. The comparisons were made using either tong-testers or watt-hour meters.

BITS STAY SHARP LONGER
The Kennametal Bit illustrated is typical of a set that cut 100 places (Winifred Seam, W.Va.) before being sharpened. Bits were still capable of cutting several hundred more places.

The severe cutting conditions at Vinton Coal and Coke Co. had often made bit changing necessary after each place cut. Bits had to be discarded after cutting a maximum of only 10 places.

The company decided to change to Kennametal to increase their tonnage per shift. They have found that Kennametal U-1 Bits give them greater production, as expected, by cutting 100 places to the other bits' 10. Important *additional* savings in time, power output, and bit sharpening costs were also effected. *Overall savings,* mine executives estimate, *amount to 5¢ per ton.*

Kennametal Bits give outstanding service because of their practical, proven design, and because their tough, Kennametal tips have shock and wear-resistant qualities equalled by no other tungsten-carbide in the coal industry. Your Kennametal representative —a veteran mining man—will gladly go into your mine to demonstrate and prove how these Kennametal advantages can reduce *your* cutting or drilling costs. Get in touch with him today!

Kennametal Inc., Mining Tool Div., Bedford, Pa.

KENNAMETAL®

Quality Carbide Of The Coal Industry

World's Largest Manufacturer of Tungsten-Carbide Mining Tools

See JEFFREY AT THE COAL SHOW

Usual area on the lower Lakeside level

SHUTTLE CARS

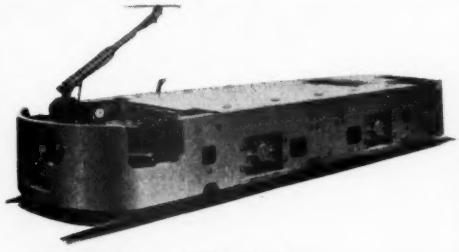
Cable reel types in various heights and with elevating discharge. Operator's deck either left or right side. Three models will be on display.

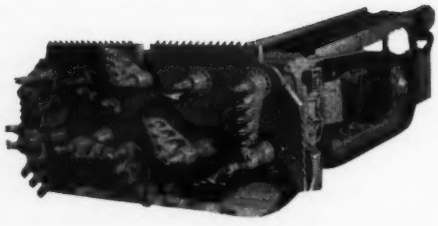
BELT CONVEYORS

For intermediate or main line haulage. Extensions easily and quickly made to keep up with room development. Also chain conveyors in various types and sizes.

LOCOMOTIVES

On display will be this 13-ton Main Line Locomotive with semi-magnetic contactor control, air brakes and sanders. Timken roller bearing journals and axles.



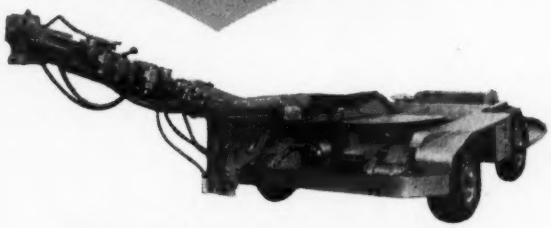


COLMOL Continuous Mining Machine

Various models for mining and loading without use of explosives. Mines an entire room 9′ 6″ wide to full height of seam. See this unit during the Show.

UNIVERSAL CUTTERS

Cutter bar can be rotated and positioned to cut anywhere in the seam — top or bottom cutting and shearing. Will make 30′ horizontal cut. Also SHORTWALL coal cutters.



ROOF DRILLING MACHINES
The RDR features a specially-designed, hydraulically-operated Arm mounted on either side of self-propelled, rubber-tired truck. Includes impact wrench for anchoring and tightening bolts.

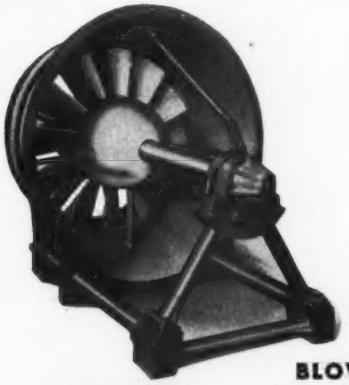
DRILLING MACHINES
The Jeffrey FHR for off-track mining features hydraulically-controlled Arm to permit drilling holes at proper place to required depth.

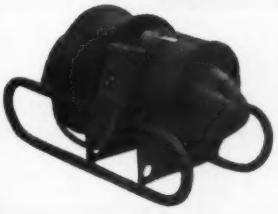
For the past 75 years, Jeffrey has kept pace with the steady growth of mechanization in coal mining. When you attend the May Exposition you will be impressed by the modern equipment Jeffrey has on display.

Today, Jeffrey offers a well-rounded line of coal mine machinery covering all phases of operation — drilling, cutting, loading, conveying, hauling, gathering, ventilating as well as preparation equipment for the top-ground plant.

Jeffrey engineers will help you determine the machine best suited to your operation both from the standpoint of increased production and low-cost operation. Consult them on your requirements.

AERODYNE FANS
A Jeffrey 12-A-58 Fan will be shown. It has 13" W. G. maximum pressure. Volumes up to 600,000 c.f.m. All Jeffrey fans are engineered to provide proper ventilation for your mine.





BLOWERS
Shown is a 5 H.P. AERODYNE midget Blower with Free Delivery Volume — 6200 c.f.m. Also Universal Blowers.

THE JEFFREY MANUFACTURING CO.
ESTABLISHED 1877
Columbus 16, Ohio
sales offices and distributors in principal cities
PLANTS IN CANADA, ENGLAND, SOUTH AFRICA

IF IT'S MINED, PROCESSED OR MOVED
. . .IT'S A JOB FOR JEFFREY!

You'll get maximum lump coal

WITH DU PONT "MONOBEL" AA

Monobel® AA is widely used because it delivers coal that mine foremen are glad to see... firm and coarse. It does an excellent job in hard-shooting seams; and its high density, combined with low velocity, produces a heaving action that evenly shears both ribs and back . . putting the coal within easy reach so that it is no problem for mechanical loaders to handle. Ideal for either top or bottom cutting.

The water-resistant characteristics of "Monobel" AA are another reason why it is the preferred permissible in wet mines. It creates little smoke, has good fumes and allows quick return to the working place.

Try "Monobel" AA in your own mine. It has aided many operators to increase output. Perhaps it can do the same for you. Any Du Pont Explosives representative will gladly give you complete information about this popular permissible and help with any blasting problem you may have. E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Del.

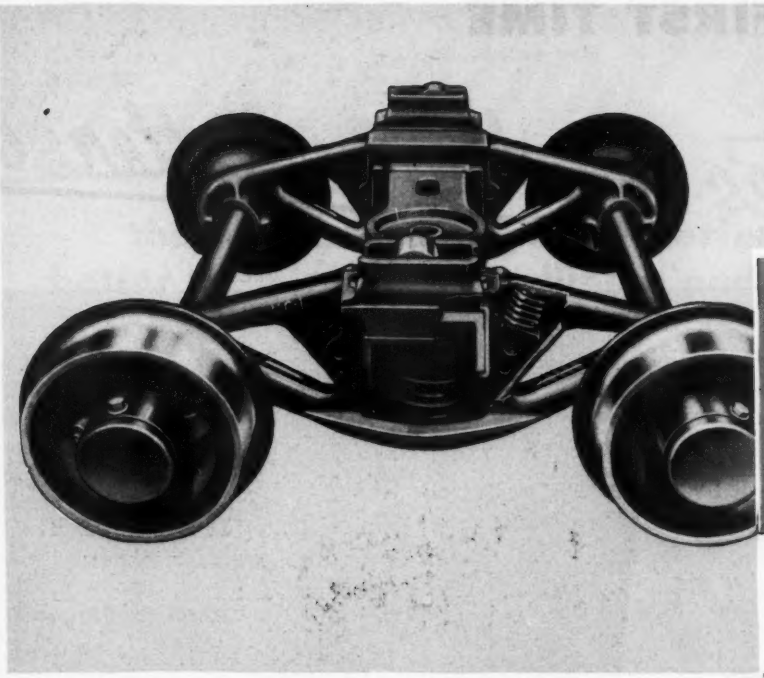
Plan to visit Du Pont in Booth 207 at the 1953 American Mining Congress Coal Show, May 11-14 — Public Auditorium, Cleveland, Ohio.

DU PONT PERMISSIBLES

Blasting Supplies and Accessories

DU PONT
REG. U. S. PAT. OFF.

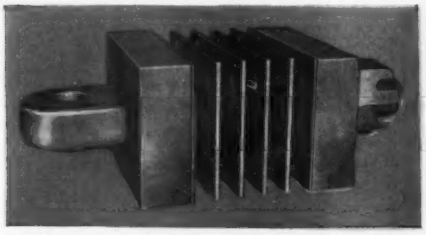
BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*



The NC-1 Truck climaxes 20 years of intensive research, providing (through the friction control mechanism shown in cutaway) protection to equipment, roadbed and lading with maximum wear life.

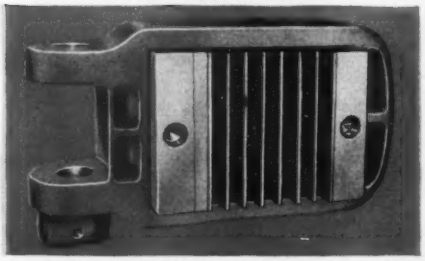
Willison Automatic Couplers save time with maximum safety . . . can be coupled at either end of car or locomotive . . . require no manual assistance. Close coupling eliminates damaging slack, permits high speeds with maximum stability.

NATIONAL *products cut per ton costs!*



National M-230 Rubber-Cushioned Draft Gear for cars operating through rotary dump. Soft initial-action, high-capacity rubber pads provide maximum impact protection, lengthen equipment life. Available in a range of capacities and design variations to fit individual requirements.

Latest example of National's pioneering in better equipment is the NC-1 Truck. Its sweeping advancements over conventional trucks include long soft springs, a friction mechanism—controlling vertical and transverse oscillations, a cast one-piece bolster with large lubricated center connection, and automatic frame alignment. The NC-1 has been designed with the same factor of safety that is required by the Association of American Railroads for full size railroad trucks, and embodies the same features which A.A.R. tests have shown to be essential to produce good riding qualities. For the best in profitable equipment, *always specify National products.*



M-225 Rubber-Cushioned Draft Gear for locomotives and large capacity cars not required to operate through rotary dump. Maximum protection in minimum space.

A-2863

Be sure to visit Booth 1618 at the American Mining Congress 1953 Coal Convention and Exposition • May 11-14 • Cleveland, Ohio

NATIONAL Products FOR TRANSPORTATION AND INDUSTRY

NATIONAL MALLEABLE and STEEL CASTINGS COMPANY

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Willison Automatic Couplers • Friction & Rubber Draft Gears • Car Trucks • NACO Steel Wheels • NACO Steel Links & Swivel Hitchings Est. 1868

FOR THE FIRST TIME

Here's the Heyl & Patterson

SEE
"JET-INJECTION"
in actual operation
at the 1953 Coal Show

Visit Heyl & Patterson—Booth 1529

"JET-INJECTION" Cyclone

that makes H&P Cyclone Performance better than ever for desliming and classifying

Heyl & Patterson Cyclone Thickener Equipment . . . well known and accepted for efficient, low-cost thickening, classifying, clarifying and desliming . . . now has expanded limits of performance, with the new Heyl & Patterson "Jet-Injection" Cyclone.

In "Jet-Injection" operations, water is forced into the Cyclone at a definite rate and under controlled pressure. This results in a sharper and a more accurate classification of the slurry provided the installation is properly engineered and "Jet-Injection" correctly applied.

During desliming or classifying operations, objectionable slimes that formerly reported to the underflow of the Cyclone with the "wanted" materials can now be removed in the overflow with "Jet-Injection."

And, of great importance, there is no decrease in the recovery of the "wanted" materials with "Jet-Injection."

PROOF OF "JET-INJECTION" PERFORMANCE

Results of tests that were made in the Heyl & Patterson laboratory and in the field under actual operating conditions show the advantages of "Jet-Injection":

TEST #1

PROBLEM: Deslime a slurry having 10% solids concentration by weight containing 70% minus 325 mesh (minus 44 microns) material with a Heyl & Patterson Cyclone.

RESULTS *WITHOUT* "JET-INJECTION": Recovered product contained 10% minus 325 mesh material.

RESULTS *WITH* "JET-INJECTION": Recovered product contained 4.6% minus 325 mesh material.

TEST #2

PROBLEM: Classify a slurry having 10% solids concentration by weight containing 30% minus 200 mesh (minus 74 microns) material with a Heyl & Patterson Cyclone.

RESULTS *WITHOUT* "JET-INJECTION": Recovered product contained 8% minus 200 mesh material.

RESULTS *WITH* "JET-INJECTION": Recovered product contained 4% minus 200 mesh material.

These results were accomplished without any loss of "wanted" materials.

WHEN YOU TALK, THINK OR DECIDE ABOUT CYCLONES, REMEMBER . . .

. . . Heyl & Patterson's experience pays off for you. Heyl & Patterson research engineers have spent thousands upon thousands of hours experimenting with and perfecting H & P Cyclone Thickener equipment.

This extensive experience, combined with our testing facilities, enables Heyl & Patterson engineers to predict accurately the Cyclone performance in almost any situation.

You save time, money and worry when you call on H & P's experience and know-how to help you with your problem of thickening, classifying or clarifying.

For complete information on H & P Cyclone Thickeners and the new "Jet-Injection" write for our booklet CT-31.

Cyclone Thickeners
Thermal Dryers
{The Drying Dutchman / Reineveld Centrifugal Dryer}
Thorsten Coal Handling Systems
Rotary Mine Car Dumpers
Coal Crushers
Coal Preparation Plants
Bradford Breakers

Heyl & Patterson, Inc.

"SINCE 1887"

55 WATER STREET · PITTSBURGH 22, PA

3 GRADES OF SELECTED DIAMONDS

2 IMPROVED TYPES OF CAST-METAL MATRICES

2 MODERN POWDERED METAL MATRICES

DOUBLE-TUBE REAMING SHELL

Available in all standard sizes for use with all types of double-tube corebarrels. Special sizes and types as required. Inserts are tough tungsten-alloy matrix set with carefully selected diamonds.

SINGLE-TUBE REAMING SHELL

Available in all standard sizes for use with all types of single-tube core barrels. Larger sizes and special designs as required. In order to fill orders promptly for either single- or double-tube reaming shells we must know the make and model of the core barrel.

CASING-SHOE BIT

Available in the same wide range of sizes and types as our standard casing bits and designed so that they can be left on the end of the casing in the hole while drilling is continued through them with the corresponding standard size of core barrel and bit.

STANDARD CASING BIT

Available in all standard sizes with a choice of four different matrices and three different grades of selected diamonds. Larger sizes and special designs furnished as required. Must be removed before continuing to drill with core barrel and bit.

STANDARD CORING BIT

Available in four different matrices and three different grades of correctly-sized diamonds, EX, AX, BX and NX sizes carried in stock. Larger sizes and special designs furnished to meet any specifications or requirements.

IMPREGNATED CORING BIT

Especially suitable for drilling through hard, broken or extremely abrasive ground, where diamond loss from surface-set bits might be excessive. EX, AX, BX and NX sizes carried in stock. Larger sizes and special designs as required.

We KNOW What These Bits Can Do

Because Our Own Drilling Crews Use Them

For more than sixty years Sprague & Henwood, Inc. has been a leader in the field of Contract Diamond Drilling and our crews—operating throughout the United States and many other countries—have constituted the best possible "laboratory" for proving the quality of Sprague & Henwood bits. They demand the best and we can't afford to give them anything less.

As manufacturers, therefore, we are in the highly advantageous position of KNOWING the relative value of every Sprague & Henwood bit for any given drilling condition, from the performance records of our own crews. And this valuable information is passed on to bit purchasers without charge or reservation.

If you use diamond drilling bits we want you to have a free copy of our new Bulletin No. 320. Write for it today and tell us about your drilling conditions. Our experienced executives welcome opportunities to make money-saving recommendations.

CONTRACT CORE DRILLING

is a very important phase of our business. This includes exploratory drilling for coal and ore — also foundation testing for bridges, dams and other heavy structures. Experienced crews and supervisors are available for service anywhere in the United States and many other countries. Estimates submitted on request.

SPRAGUE & HENWOOD, INC. Scranton 2, Pa.

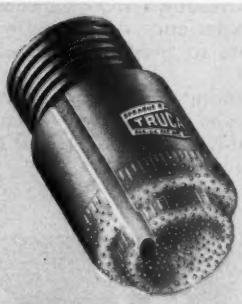
See our four-page insert in the McGraw-Hill Mining Catalogues

SERIES "M" CORING BIT

For use with Series "M" Double Tube Corebarrel as developed by Sprague & Henwood, Inc. to meet the need for a higher percentage of core recovery from soft, broken or friable material than can normally be obtained with a standard double-tube corebarrel. Available in all four types of matrix and three different grades of diamonds. Also in a complete range of "impregnated" type bits. EX, AX, BX and NX sizes carried in stock.

"CONCAVE" TYPE NON-CORING BIT

Especially suitable for drilling round smooth holes in relatively soft formations, when cores are not required. All standard sizes available in four different types of matrix.



"PILOT" TYPE NON-CORING BIT

Recommended for drilling blast holes in hard formations and also for use when long straight holes must be drilled in variable formations.

"TAPER" TYPE NON-CORING BIT

The fastest cutting bit for drilling blast holes in very hard formations. All standard sizes.

PUMPS

for FLUID POWER

To perform a hundred and one functions in deep or strip mining . . . pulling, pushing, lifting, lowering, spinning, twisting... providing controlled power as only hydraulic power can deliver it. Here is a range of Pump types, capacities and pressures 0 to 1,500, 2,000 and 3,000 psi. Here, too, are motors, valves and cylinders to be integrated into complete hydraulic circuits which translate power into efficient, economical, trouble-free accomplishment.

for HANDLING LIQUIDS

An exceptionally broad range of types, sizes, and special constructions to handle virtually "any substance that will flow through a pipe" . . . deep and shallow well Centrifugal and Turbine Pumps . . . Rotating Plunger and Herringbone Gear Pumps with capacities from 3 to 7,500 gpm.

for VACUUM PROCESSING

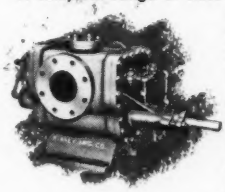
in pump sizes for the laboratory or high production. Extensively used in research, dehydration, refrigeration, vacuum drying, vacuum refining of metals, electronic and atomic research.

HYDRECO GEAR TYPE PUMPS

Reversible and non-reversible. Gear type pumps in exclusive FOUR-BOLT design . . . capacities from .5 to 130 gpm and operating pressures to 1500 psi . . . flange or foot mounted . . . furnished with keyed shaft with spline shafts optional. Also dual and tandem models.

KINNEY LIQUID HANDLING PUMPS

A complete range of sizes in Rotating Plunger and Herringbone Gear Pumps to handle light or heavy liquids, sludges, slurries or viscous substances. Available in plain or steam jacketed models and built of special corrosion resistant metals where desired.

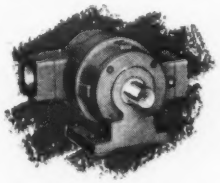


KINNEY VACUUM PUMPS

Single stage models to produce absolute pressure readings of 10 microns (.01 mm Hg.) . . . compound pumps producing readings of .2 microns (.0002 mm Hg.) or better. These Kinney High Vacuum Pumps are available in sizes for laboratory as well as high production use.

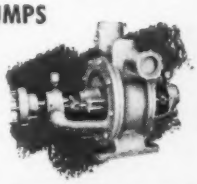
DUDCO DUAL VANE TYPE PUMPS

DUDCO Pumps provide a broad range of sizes with capacities to 120 gpm and pressures to 2000 psi. Also available in multiple units operating from a single drive. Hydraulic motors with starting torque outputs to 14,000 lb. in. at 2000 psi.



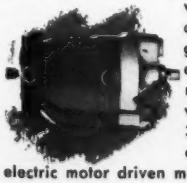
AURORA CENTRIFUGAL & TURBINE PUMPS

Deep well, sump, drainage and condensation return units, household water systems. Industrial low and high pressure liquid handling pumps. Direct motor and countershaft driven horizontal and vertical models. Capacities 3 to 7500 gpm.



STRATOPOWER PISTON TYPE PUMPS

Axial reciprocating piston type . . . constant or variable delivery with capacities of .25 to 10 gpm at nominal speeds of 1500 rpm with maximum of 4500 rpm . . . working pressures to 3000 psi . . . direct engine and individual electric motor driven models.



Write—

For detailed information on the type of pump in which you are interested.

THE NEW YORK AIR BRAKE COMPANY

230 PARK AVENUE • NEW YORK 17, N.Y.

THE NEW YORK AIR BRAKE COMPANY
230 Park Ave., Dept. MC, New York 17, N. Y.

Gentlemen: Kindly send additional information on the pumps I have checked.

- ☐ Hydreco Pumps
- ☐ Kinney Liquid Handling Pumps
- ☐ Stratopower Pumps
- ☐ Kinney Vacuum Pumps
- ☐ Dudco Pumps
- ☐ Aurora Pumps

Name .....

Address .....

City ..... State .....

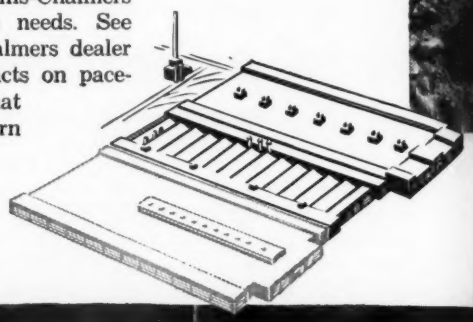
There's more to tractors than meets the eye . . .

The real "pay-off" value of any tractor to its owner is how it measures up to the standards set by today's modern production methods.

To meet these needs, Allis-Chalmers started from scratch and built *a line of tractors with a future.* Thousands now have been tested and proved on the toughest proving ground of them all, actual jobs, and they have more than measured up to expectations. Owners have found that these tractors set new standards of performance . . . that they give greater output with less down time . . . plus more profit, whether pulling, pushing, digging or dozing. Operators have discovered new ease and comfort in operation, too; and mechanics say these are the easiest-to-service tractors that they have ever worked on.

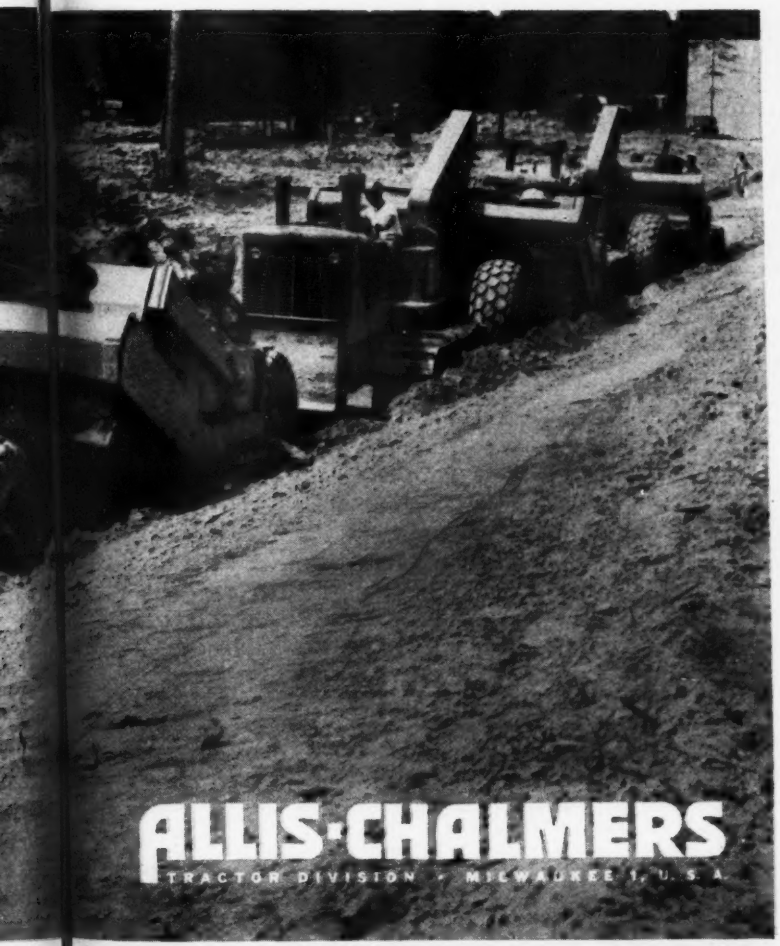
Yes, the "family circle" of users of Allis-Chalmers tractors is growing constantly. Many users who bought their first Allis-Chalmers tractor only a few years ago now have fleets of them, and many others who operate only one or two tractors have become Allis-Chalmers boosters.

This acceptance is the springboard behind a big plant expansion at Springfield, Illinois, which will enable Allis-Chalmers to meet *your* future needs. See your nearby Allis-Chalmers dealer now for the inside facts on pace-setting tractors that measure up to modern production methods.



For stripping overburden, hillside seams, cleaning pit bottoms, building access roads . . . wherever big production is essential to the job, this big HD-15 has more than proved its worth. With 109 drawbar hp. and 27,850-lb. weight, it works quickly, efficiently as a dozer, tractor-shovel, puller or pusher.

This 72 drawbar hp., 18,800-lb. HD-9 is making friends in every field because its power and weight make it an ideal size for dozens of today's modern jobs. In addition, operators can gain up to 25 percent more production on short dozing jobs because they can go from any forward speed to any reverse speed with just one shift.

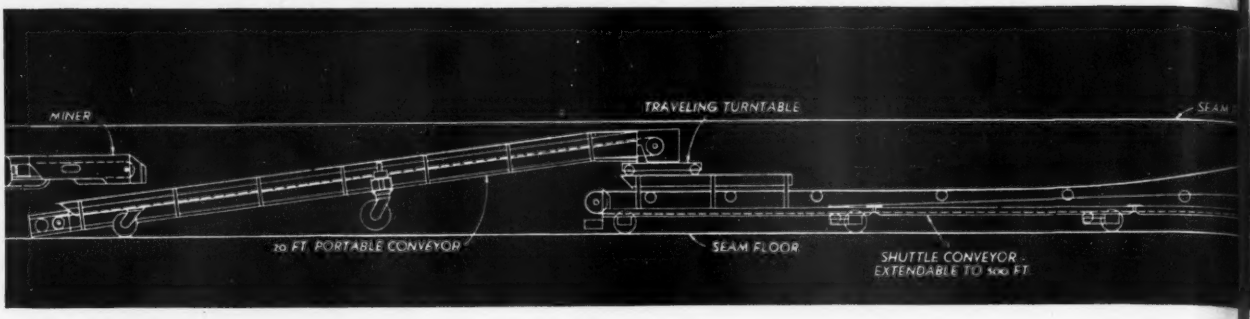


ALLIS-CHALMERS

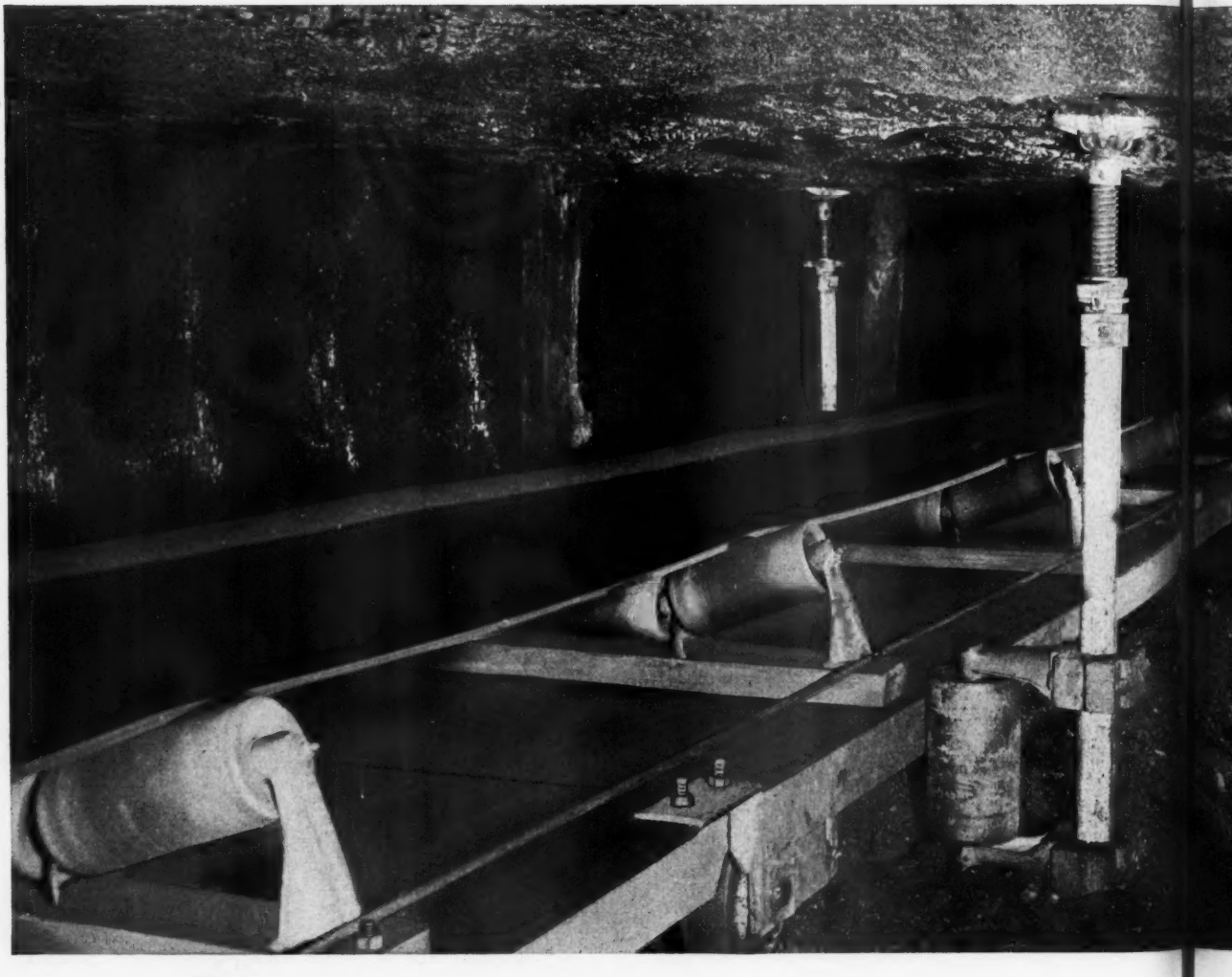
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

The 40-drawbar hp., 11,250-lb. HD-5 is a versatile jack of all jobs above or below ground. With hydraulically controlled Tracto-Shovel, it's equally useful handling ore and coal, cleaning up around conveyors and hoppers, loading hauling units, dozens of other jobs.

Here's real tractor teamwork . . . four HD-20's in a "train" — three pulling scrapers, one pushing — all working together for big production. With torque converter drive, they synchronize speeds at contact . . . automatically load at the fastest speed that job conditions permit, with less strain on operators and equipment. With 175 engine hp. and 41,000 lb. weight, the HD-20 is today's new yardstick of crawler tractor performance.



See This New Answer to



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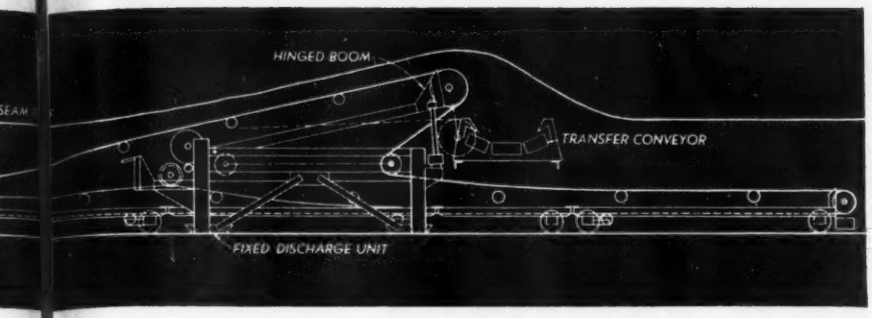
DIVISIONS: HEWITT RUBBER • ROBINS CONVEYORS • ROBINS ENGINEERS



Continuous Mining

Don't Miss The Hewitt-Robins Mine Type Shuttle Conveyor In Action

On Display In The Main Exhibit Hall At The Coal Show — Booths 700, 714, 718 & 720

Now, for the first time, you can see the Hewitt-Robins Mine Type Shuttle Conveyor with fixed tripper in actual operation at the Coal Show in Cleveland, May 11th-14th.

Learn how this remarkable unit provides the key to truly continuous mining from face to preparation plant . . . provides a belt conveyor unit that is both extendable and retractable—can follow the progress of mining and at the same time maintain a fixed transfer point through a fixed tripper.

Discover how the Hewitt-Robins Mine Type Shuttle Conveyor forms the final link in a complete belt conveyor system that can handle an uninterrupted flow of coal directly from the face as fast as any mechanism can produce it.

When it comes to any type of belt conveyor system for coal handling anywhere . . . in the mine, on the slope, overland or in the preparation plant . . . only one company can assume single and unified responsibility for successful operation. Only Hewitt-Robins can provide —from within its own corporate structure—every element of successful belt conveyor performance including designing and engineering, manufacture of *both* belting and machinery and complete installation.

CHECK FOR INFORMATION ABOUT THESE JOB-TESTED PRODUCTS FOR YOUR OPERATION

CONVEYORS:

☐ —Belt ☐ —Dock
☐ —Mine ☐ —Shuttle
☐ —Slope ☐ —Vibrating
☐ —Fixed Tripper Shuttle

BELTING:

*☐ —Elevator
*☐ —General
*☐ —Hot Materials
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*☐ —Steel Wrapper
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*☐ —Twin-Weld® *☐ —Water
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☐ LOADING BOOMS
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☐ MOLDED RUBBER PRODUCTS
☐ DESIGN AND CONSTRUCTION OF COMPLETE MATERIALS HANDLING SYSTEMS

*For immediate information about these industrial rubber products, call your Hewitt Rubber Distributor (See "Rubber Products" Classified Phone Book.)

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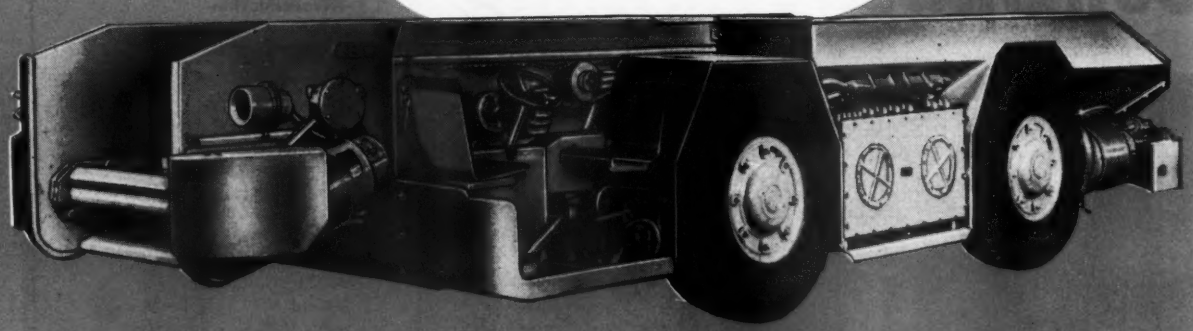
THE JOY 10-SC SHUTTLE CAR...

1953 MODEL!

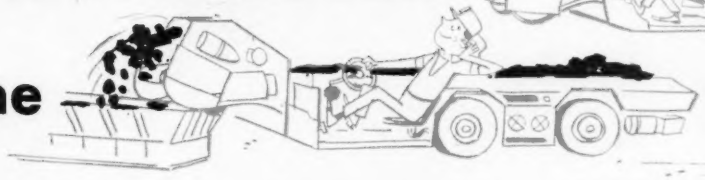


The improved Joy 10-SC Shuttle Car is available as a Permissible or Non-Permissible unit, for net payload capacities up to 10 tons. It is built in 43", 48" or 54" heights (machine only) and may be equipped with 4", 6" or 8" sideboards. Tramming speed loaded is approximately 4½ m.p.h., and the unit is equipped with Joy-pioneered hydraulic cable reel, and hydraulically adjustable elevating discharge.

CAN MAKE MONEY FOR YOU!

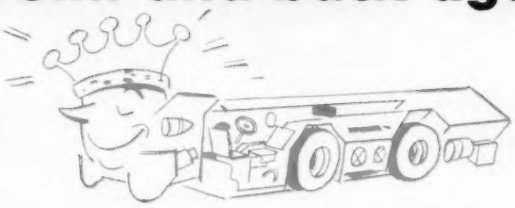
It gets from the Face

to the



Discharge

Point and back again



faster than any

other car on the market

This latest model 10-SC is away out in front—more than ever before the world's leading shuttle car for heavy-duty, high-production service. Particularly ideal for full-seam mining because it can handle full loads of coal or rock with equal ease, the 10-SC Shuttle Car is now capable of new potentials in productivity, maneuverability, and dependable performance with lowest maintenance.

MORE ROUND TRIPS PER SHIFT

The 1953-model 10-SC can travel, discharge and return faster than any other car in its class. That means more pay-loads per shift—and it may also mean more efficient use of other equipment, such as Continuous Miners, Loaders, Belt Conveyors, etc.

15 HP traction motors of new design provide more dependability and more reserve power for increased speed, maneuverability and carrying capacity. Wheel units and brakes are of over-capacity size for continuous heavy-duty service, and the gearing and frame are also over-capacity. Higher speed conveyor discharge, with higher-HP motors, actually gets discharge time down to three-quarters or half the time formerly required.

OTHER JOY-PIONEERED FEATURES

The 1953-model 10-SC Shuttle Car has 4-wheel positive steering, 4-wheel drive and 4-wheel brakes. The hydraulic "power steering" innovation in the automotive world has been a standard patented feature of Joy Shuttle Cars for years . . . one of the reasons for their high maneuverability.

The 10-SC's smooth, grab-free disc-type brakes (the type widely used on aircraft) were also pioneered by Joy for underground use. They provide exceptional stopping power with extreme simplicity and low maintenance . . . ideal for mining use because they're unaffected by dirt, coal dust, oil or water.

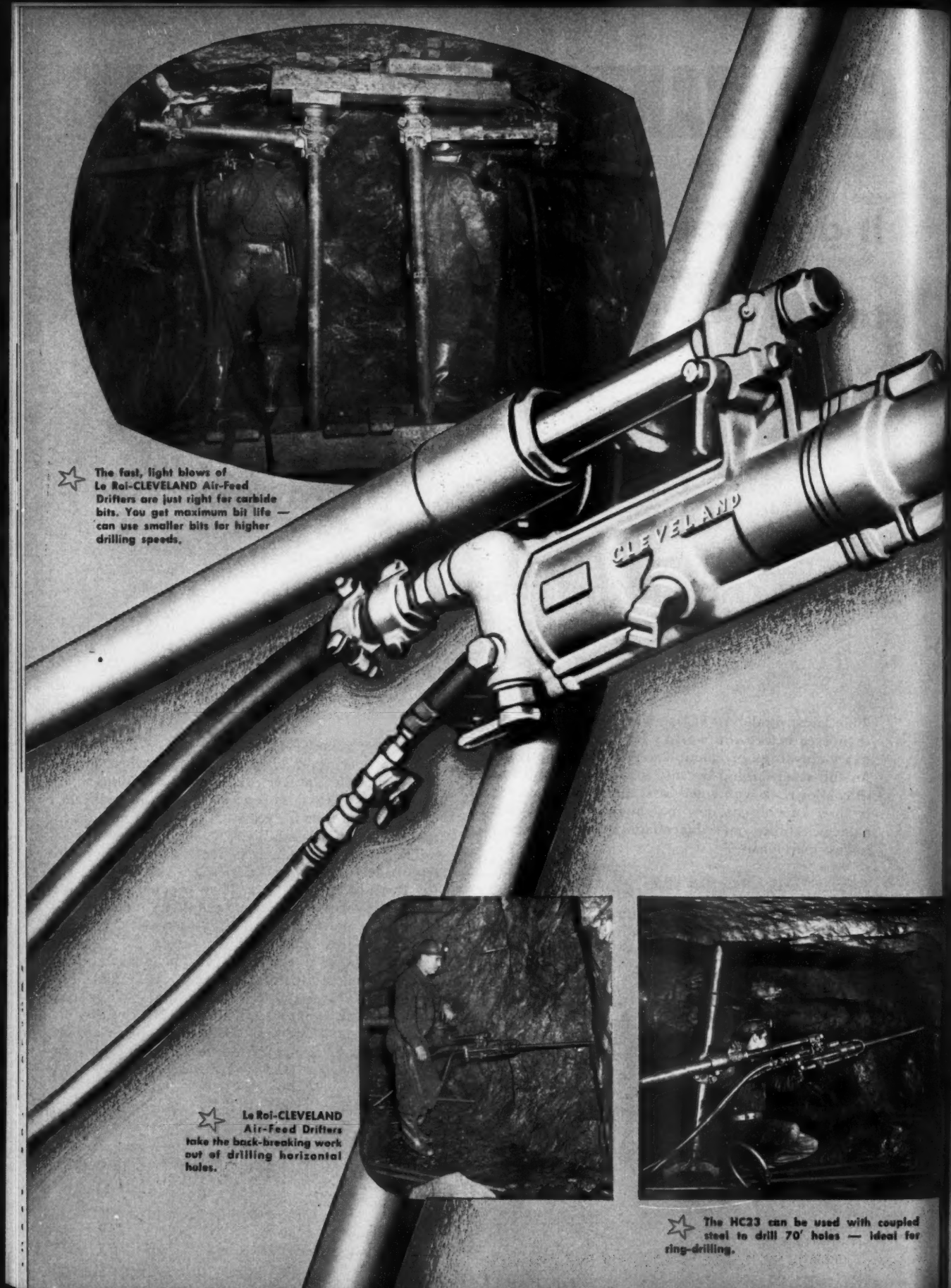
Other features of the new 10-SC include: improved arrangement of operator's controls for fool-proof driving; improved "zone" lubrication for fast, easy servicing; the famous Joy "Magnetax" controls, etc.

● For full data, address ***Joy Manufacturing Company, Oliver Bldg., Pittsburgh 22, Pa. In Canada:*** *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

Consult a Joy Engineer

JOY

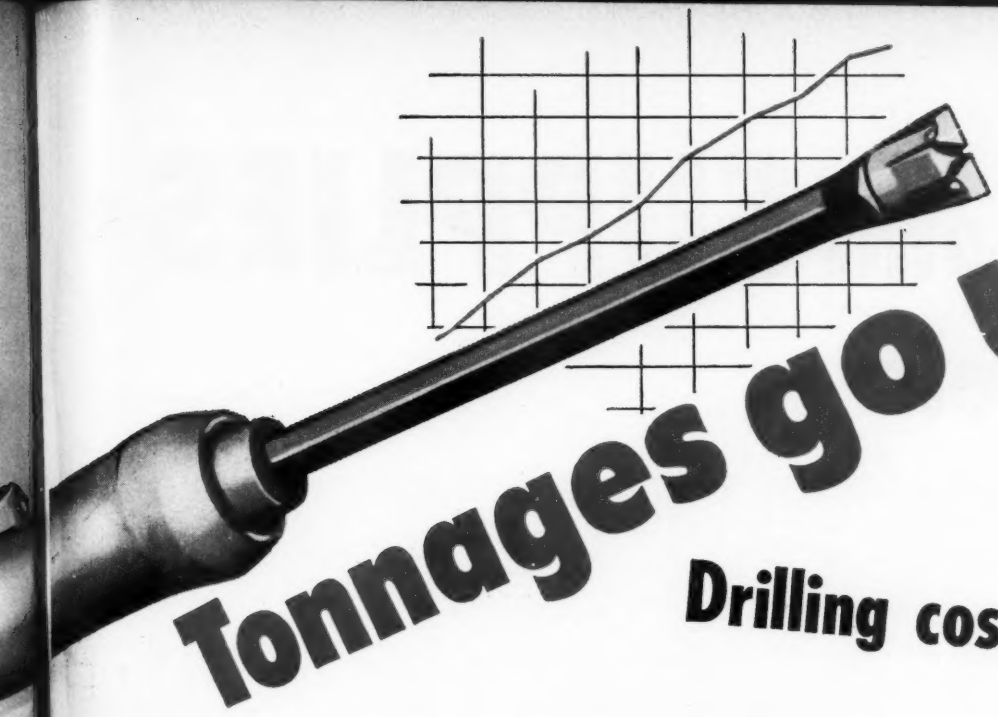
WORLD'S LARGEST MANUFACTURER O
UNDERGROUND MINING EQUIPMEN



The fast, light blows of Le Roi-CLEVELAND Air-Feed Drifters are just right for carbide bits. You get maximum bit life — can use smaller bits for higher drilling speeds.

Le Roi-CLEVELAND Air-Feed Drifters take the back-breaking work out of drilling horizontal holes.

The HC23 can be used with coupled steel to drill 70' holes — ideal for ring-drilling.



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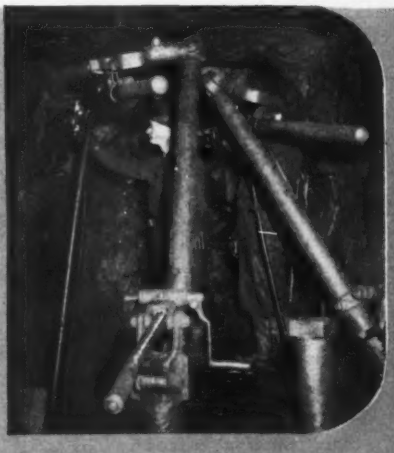

The accent's on production in this mine. Le Roi-CLEVELAND Air-Feed Drifters make possible faster set-ups, faster steel changing, faster drilling.

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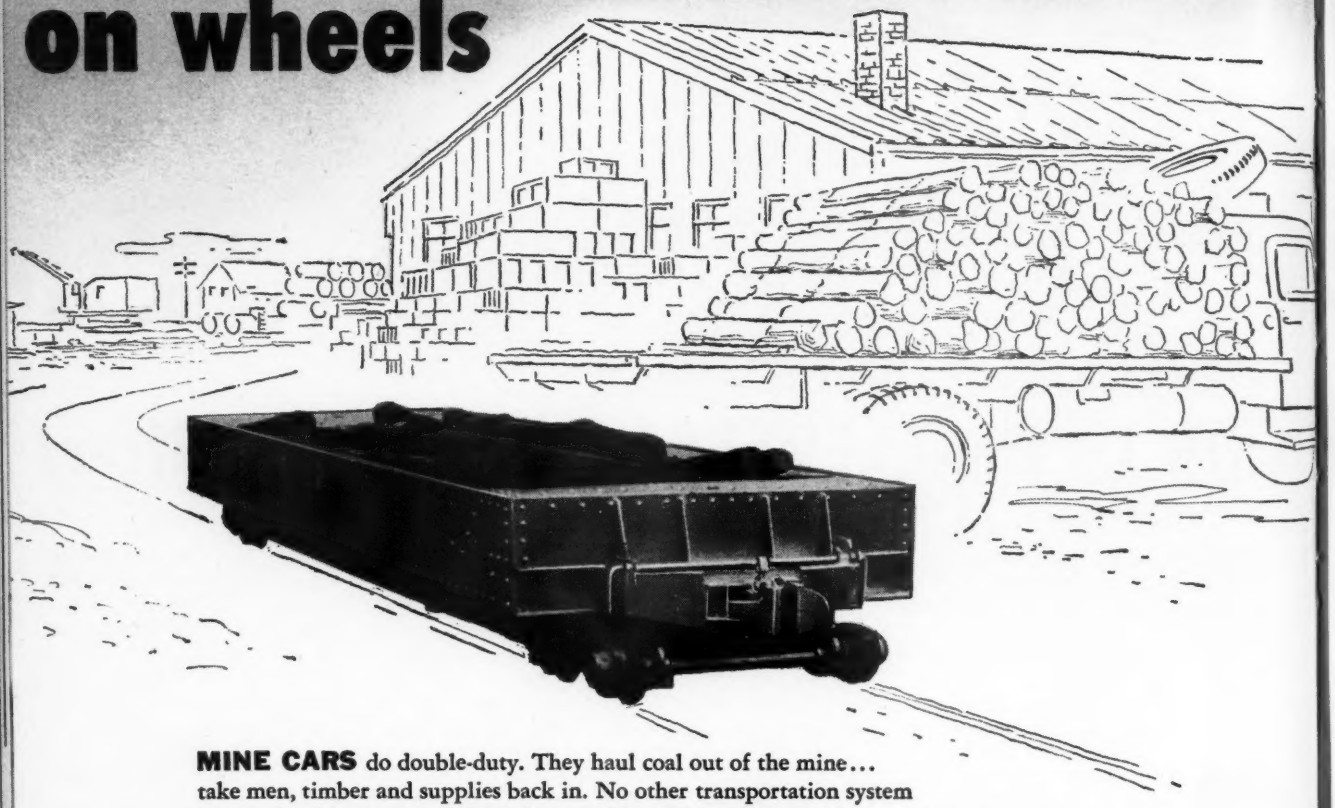

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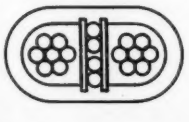

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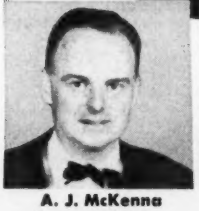

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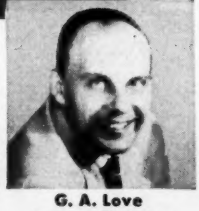

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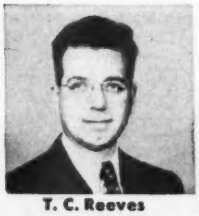

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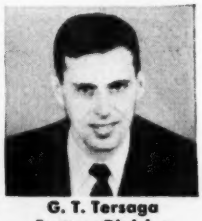

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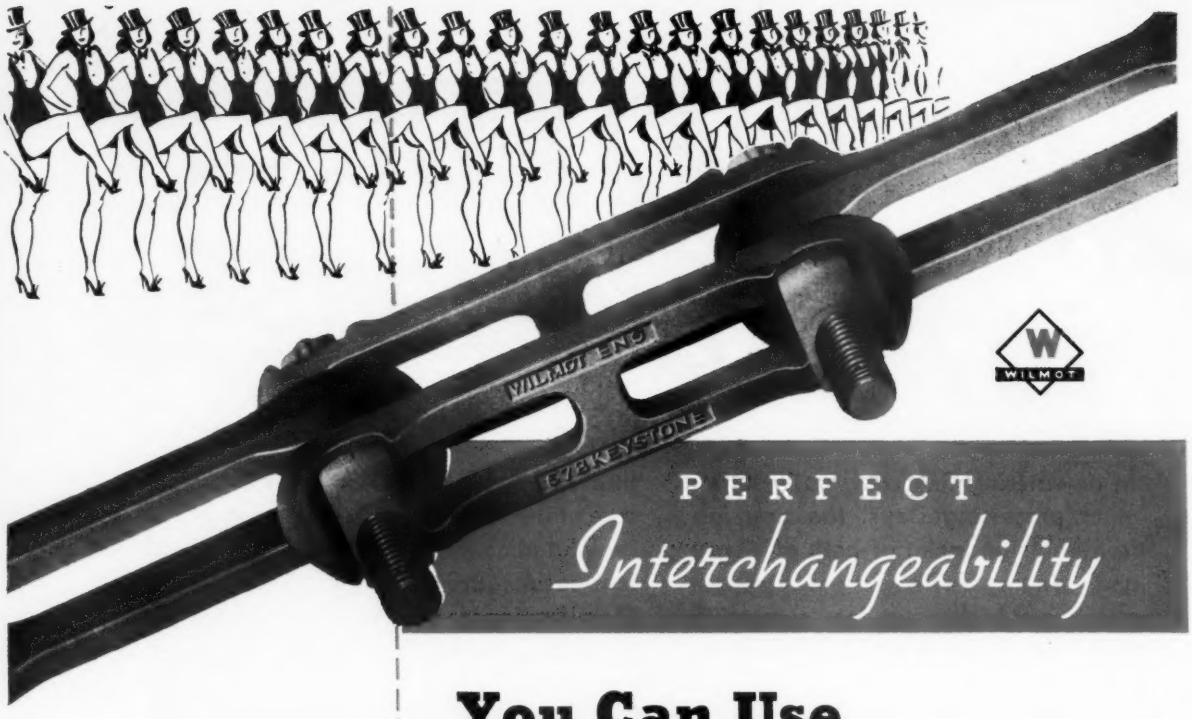

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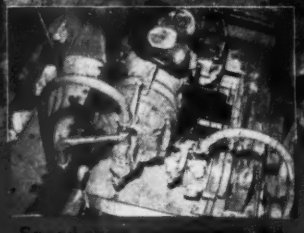

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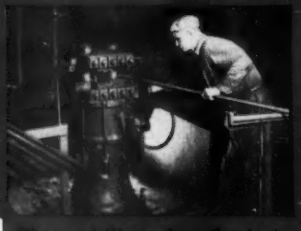

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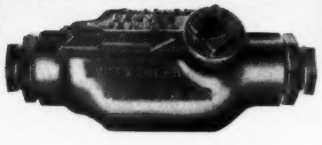

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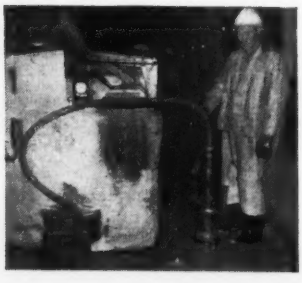

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Editorials

JOHN C. FOX, *Editor*

APRIL, 1953

What About Lead and Zinc?

LAST month on this page we cited the disastrous effects that uncontrolled dumping of foreign residual fuel oil has had on the domestic coal industry, and outlined a plan to protect the American coal miner.

Now we turn our attention to the plight of our lead-zinc mining industry. This basic industry is in sore straits indeed. In spite of consistently high requirements for these metals, the prices plummeted in the course of a few months from 19 and 19.5 cents per pound to lows of 13 and 11 cents.

The cause? Excessive supplies, accumulated abroad through manipulative and monopolistic practices of foreign governments, were suddenly dumped at distress prices in our lead and zinc market. Before the war, we imported about 75,000 tons of lead per year; in 1951, 265,886 tons and in 1952 imports totaled 637,000 tons. Zinc imports increased in the same manner from 397,679 tons in 1951 to 568,476 in 1952.

The result? A depression for the domestic lead and zinc mining industry—scores of mines shut down—thousands of miners out of work—whole communities deprived of a means of livelihood. All this while the wheels of industry continue to turn out military and civilian goods at record high rates.

The remedy? Spokesmen for the entire lead-zinc mining industry have asked for a sliding scale stabilization import tax on these metals. Under their proposal base prices for lead and zinc would be set at a level designed to perpetuate the industry. These prices would be adjusted periodically to reflect changing economic conditions. When the market is equal to or greater than the base price, no import tax would be charged. Should the market fall below parity, an import tax, increasing as the price decreased, would be levied on imported metal and on the metal content of imported ores and concentrates.

This is a simple device designed to provide a floor similar to that enjoyed by agriculture, but even more necessary in this case. Many plans proposed for "stabilizing" markets are objectionable because they involve government coercion or a vast bureaucracy for their administration and involve discrimination between producers. This plan would be non-discriminatory and almost automatic in its application. The necessary imports would be readily procurable, but without ruining the domestic industry.

Producers and consumers alike are plagued by violent market fluctuations. A sliding scale stabilization import tax would cushion these without un-American government controls. Let the foreign market fluctuate as widely as it chooses; such an import levy will provide us some protection; allow mines to continue to operate, stimulate search for new ore deposits, permit needed imports and enable consumers to procure their lead and zinc at reasonable cost.

If we want a vigorous, healthy, domestic lead-zinc mining industry—and we need one for our national security—we must provide a stabilizing influence for that industry.

The sliding scale stabilization import tax, as advocated by the National Lead-Zinc Committee would be such an influence. Its simplicity and fairness to all point to its success where other devices have failed. Here is an unparalleled opportunity for constructive action. Let's follow it through.

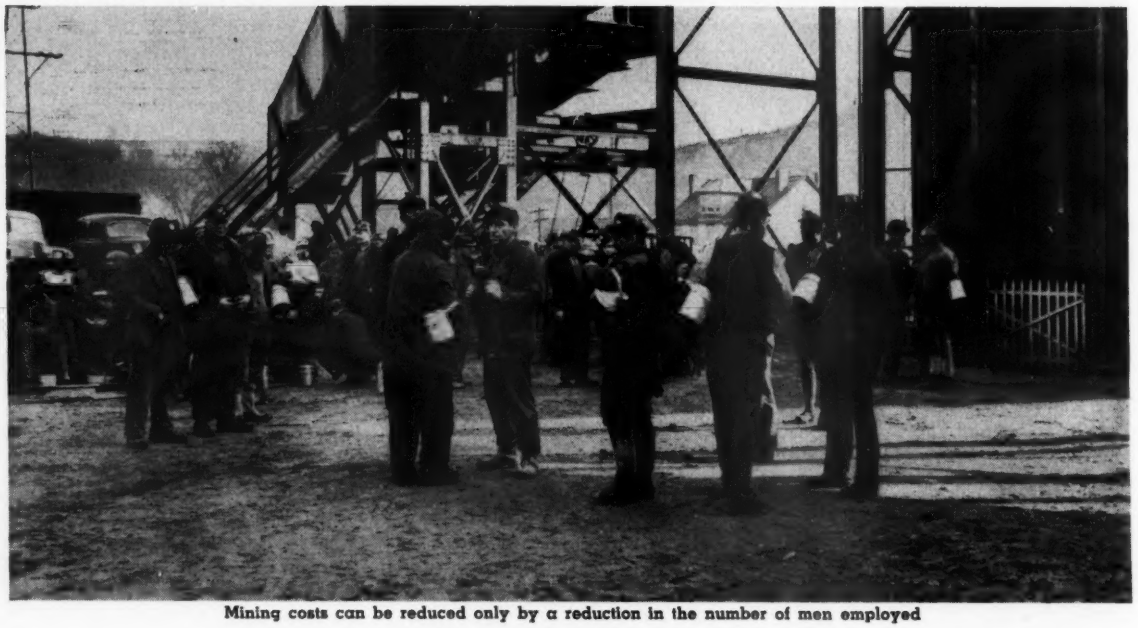
Coal Goes to Cleveland

IN this issue MINING CONGRESS JOURNAL proudly presents a preview of the 1953 Coal Convention and Exposition, May 11-14.

Every other year, coal men gather at the Public Auditorium in Cleveland for the Coal Show. They come from every corner of the earth to hear about the latest advances in coal mine modernization and to see at first hand what the manufacturers and suppliers to the coal industry have devised to make possible those advances—and others yet to come.

They exchange information, meet old friends, make new ones and go away filled with new ideas and enthusiasm for the monumental task of mining the coal that provides power for industry, light and heat for our homes and chemical raw materials for the host of things that make life better and pleasanter.

Attendance at the Coal Show is a must for every coal man interested in better, safer production and preparation of coal. Join the crowd at Cleveland and see for yourself.



Mining costs can be reduced only by a reduction in the number of men employed

A Review and Forecast of Continuous Mining

Born in 1924, Continuous Mining Gathers Momentum. Much Remains to Be Done, However; Particularly with Auxiliary Operations

By M. H. FORESTER
Vice-President
Pittsburgh Consolidation Coal Co.

THE Bituminous Coal Industry has made tremendous progress during the past 15 years in the mechanization and modernization of its producing plants and properties. Lacking some of the handicaps encountered in foreign lands, whence the coal mining pioneers in our country came, and richly endowed with favorable physical characteristics and conditions, we have forged far ahead of all others in technique, productivity and cost. Much of this might have been achieved 20 years sooner, had there not been a combination of circumstances to serve as a deterrent. Consider just for a moment what might have been avoided during the depression years had the industry embraced mechanical loading and cleaning when first offered about 1920. After all, the minimum annual bituminous tonnage consumed during those years of 1930 to 1940 was 309,000,000 tons produced at a loss of $52,000,000, or 17 cents per ton.

One of the factors still somewhat prevalent in our industry might be called the "resistance to change"—a certain element of reluctance to accept the challenge of new ideas, new equipment and new methods of mining. To illustrate that point, just ask yourself, how many coal operators appreciate the fact that a "Continuous Mining" machine has been commercially available to the industry since 1924? Ten of these machines, known as "Entry Drivers," were built and proved their practical worth at that time, but only two survived. And these continued in regular service for 20 years yielding 30 tons per face man, before any effort was made to improve them and extend their usefulness. Then quite unexpectedly in 1947, another machine of that type made its appearance, and was immediately hailed as "The Continuous Miner," the answer to a prayer for lower costs.

That was seven years ago. World War II was over, the boom was beginning to subside, coal production in foreign countries, seriously affected by war damage and losses in miner population, began to come back, and American dollars were and still are being poured into rehabilitation and new developments all over the world to eventually affect our markets and economic stability adversely. Many mining properties had just completed a major operation in changing from hand loading to mechanization. Others were still engaged in the process. Nevertheless, here was the challenge of something new which made sense and the potential market from the manufacturer's standpoint seemed assured. Accordingly, such manufacturers on whom the industry had for years relied upon to supply its needs entered the field with their own particular types and models of continuous mining machines, Joy Mfg. Co. early in 1948, Jeffrey Mfg. Co. in 1949, Goodman Mfg. Co., Lee-Norse Co. and Marietta Mfg. Co. in 1950. The last named manufacturer had built ten entry drivers in the 1920's discontinued manufacture temporarily because of lack in demand, but revived again with an improved design in 1950.

172 Machines Delivered

From January 1, 1948, to January 1, 1953, there have been 172 "continuous" type machines delivered to the industry, including the Joy Continuous miner, the Jeffrey Colmol, the Lee-Norse miner, the Marietta miner, the Konnerth miner and the United Carbon machine. The last named rightfully belongs in the category of "highwall" machines, but is included because it can be used as an underground machine, and because its production during 1951 and 1952 was included in the total. These 172 machines have been tried out in 92 mines, in 30 seams, varying in height from 39 in. to 108 in., but generally in the better than average roof areas. They have been used in entries, rooms and on pillar recovery — successfully! They are available in low, medium and high coal models, with potential capacities varying from less than one to more than three tpm.

It is interesting to know that of this total of 172 machines, 93 can be classed as "in production," while 79 remain as experimental units at 34 mines. A survey made in 1952 indicated that production with "continuous" type machines during the year 1951 had reached a figure of 6,400,000 tons. Annual production in 1952 increased to 7,800,000 tons. This was affected to some degree by the period of inactivity caused by the steel strike and some market losses in other directions, but an analysis of the data available discloses that too many machine units purchased as experimental in 1950 and 1951 failed to emerge into the "production" class and even remained largely idle during 1952.

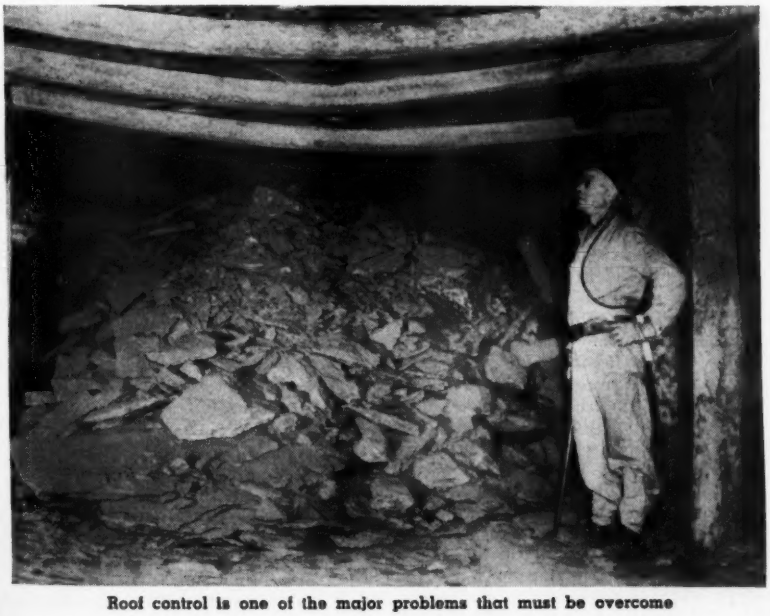
There were 153 "continuous" mining machines of domestic and foreign origin in service underground on December 31, 1952, an increase of 27 percent over 1951. Production, on the basis of figures already quoted, increased only 18.7 percent. And 27 additional machines were either used for experimental purposes on highwalls or out of service for one reason or another, without contributing anything much to the production figure quoted above.

The bulk of these machines were designed to operate in a seam height of from 42 to 72 in., corresponding to the national average of 63 in. The impression has prevailed for several years that our national production was being derived from noticeably lower seam sections. The Bureau of Mines made a survey of the situation last year, with the results published in Information Circular 7642. These seemed to indicate that little change had taken place between 1920 and 1950. As thick seams like the Pittsburgh and Pocahontas in the older eastern fields have been rapidly exploited, other thick seams in other and newer fields have been tapped.

Longwall Mining Promising

There has been less urge to develop "continuous" type models for high coal—over six ft—because the performance of conventional mechanical units has been reasonably satisfactory, particularly following the change from track to "off-track" mining. Low coal models suitable for a size range of from 28 to 36 in. present a design problem which most manufacturers and their engineering forces prefer to avoid. It is a matter of opinion whether a machine designed for operation in moderate and high seam height is basically and in principle suitable for use in mining coal under 36 in. or even 42 in. in height. That is partly the reason why interest has been revived in Longwall type machines of foreign type and manufacture. Three of these, one German and two British, were in service here during 1952 and produced 110,000 tons. One additional machine began operation in February and two more are scheduled to start later on this year. Some results of these latest longwall experiments have been published, and in spite of the skepticism prevailing in this country toward Longwall operation, there is some indication that a modification of the European practices and our own earlier experiments, with shorter faces, improved roof support equipment and much less expensive and simplified mining and loading equipment might prove to be the answer to some of our low coal mining problems.

No one will deny that competition for the fuel market of the country has become increasingly severe. Natural gas has taken over a large share of the domestic demand in the eastern and midwestern urban areas, as a result of transcontinental pipelines, and by virtue of underground storage at strategic points has attracted considerable industrial consumer business. Dieselization of railroad locomotives and the dumping of cheap foreign residual oil along the Atlantic Seaboard has supplanted large tonnages of coal. Political pressures and legislative measures against the inroads of natural gas and oil are purely protective and a more progressive approach is needed to effect a more permanent solution. Stability and competitive strength must be achieved from within. New markets may be developed in time, but economic survival hinges upon recapturing some of the tonnage lost, and holding what we have, and that seems possible only by a reduction in cost.



Roof control is one of the major problems that must be overcome

Other Problems Need Study

There has been a sharpening of demand for off-track mining equipment and continuous miners since the $1.90 wage increase and the 40-cent Welfare Fund burden became effective in the industry, reflecting the feeling that costs *can* be reduced with their use. The full benefits of the change from conventional mechanical mining to the new principle of "Continuous" mining cannot be derived, however, until certain phases are developed further and solutions to inherent problems are found. These problems can be considered in the order of their relative importance.

FACE TRANSPORTATION—First, we have the same problem encountered with the loading machine—a high enough potential capacity in tons per minute, but a low operating

figure. A multitude of time studies show that loading machines are idle from 50 to 70 percent of the shift time. Face transportation to permit continuity of operation is still lacking, though several developments to solve this perplexing question are under way. In the meantime it is quite possible to partially overcome this problem with "continuous" mining machines by using an available loading machine behind the miner and the pavement as storage. There is some degradation and atmospheric dust pollution involved, but its use eliminates the otherwise prevalent loss of 20 to 25 percent in productive operating time due to car change. However, this should only be considered a makeshift expedient, where conventional loading equipment is available and being replaced.

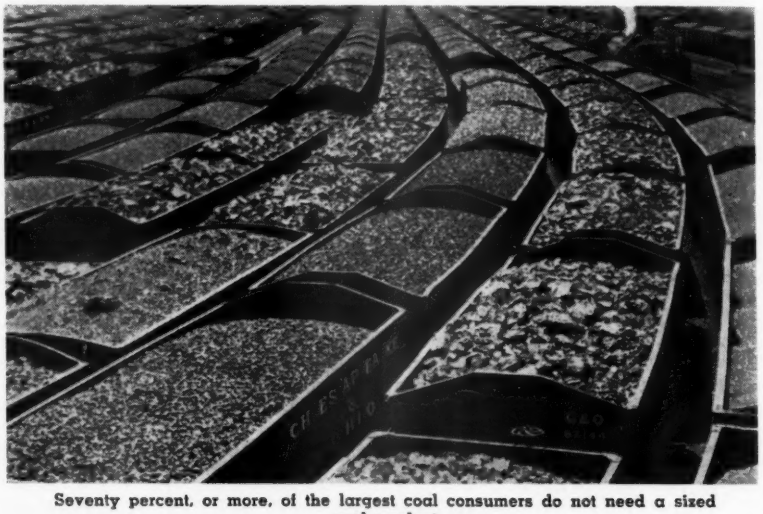
A large capacity surge car of special design has been proposed from time to time, as a possible solution for both conventional and continuous mining. It may become a reality in 1953 or '54.

ROOF CONTROL—One can safely say that the most important problem in mining is roof control. It is responsible for the largest number of fatalities and accidents to personnel, and quite generally is the key to profitable mine operation. Where mining regulations or physical character of roof require the placement or maintenance of roof supports for the protection of personnel, a 30 percent allowance of time interruption has been found fully adequate.

Only a limited number of continuous mining machines have been equipped with roof drills for bolting purposes, and considerable experimentation, design and development still lies ahead. Every machine should, however, be equipped with a hydraulic jack for use in raising cross timbers.

It was generally expected that roof conditions would be much improved, due to the elimination of blasting shock and the reduction in time for vertical and lateral pressures to come into play. In the majority of installations this has been true, some operations, however, claim to have experienced but little difference. Naturally all types of roof strata do not react in the same manner. It has been noted that the "arching" characteristic of the openings made with the circular boring type of machine has a tendency to lend unusual support to the overlying strata. Further research into the value of these arches for current roof support may serve as a guide to the width of place to be mined by continuous type machines under various types of weak or bad roof. This approach merits more consideration by roof control authorities and research groups than it has received to-date.

SIZE OF PRODUCT — There are, no doubt, some areas and mines where the reduction in size of product with the use of certain continuous mining machines compared to the conventional mine run may offset a large proportion of the gain made in face cost through loss in average realization. However, when one considers that 70 per cent or more of the largest consumers of coal, the utilities, coke and steel plants, cement mills, and a large share of the industrials do not require a sized coal product, there is little need of weighing this objection too heavily. Furthermore, some continuous mining machines do yield a size product fully comparable with that of conventional mining, and all of the manufacturers presently engaged in developing continuous miners are on the road to successfully overcoming past criticism of this type. The critical size which must not be increased to any marked degree is that percentage below ⅛ in.



Seventy percent, or more, of the largest coal consumers do not need a sized coal product

OUTAGES—There have been time losses due to breakdown which have been disturbing to many who have had one or more machines on trial, and to prospective purchasers. Any new machine has to go through a period of trial, and in the past, the operator and the manufacturer have always cooperated in finding weaknesses in a new machine and developing the cure. Some machines have suffered more breakdowns than others, but it must not be a foregone conclusion that the machine was wholly at fault. There must be an efficient maintenance and inspection program in force, as well as sympathetic and capable operating and maintenance personnel in control.

Breakdowns will occur, however, under the best of conditions and circumstances, but they can be minimized by careful planning and foresight. Where conventional equipment has been replaced, cutting and drilling equipment can be held in reserve for emergency use, and tonnage losses thereby reduced to a minimum. This is particularly valuable where seam conditions vary and unusual difficulties with sulphur balls, bands and intrusions are encountered periodically. Continuous mining machines have already been used in driving rock tunnels and slopes, but it would be folly to assume that a machine might be designed and built to mine all degrees of hardness found in coal seams, including rock partings of variable thickness, sulphurs of all types, clay veins and igneous intrusions, with equal ease and high productivity.

There are those who fear the concentration of men, equipment and production in two to four working places, when the loss of one unit through mechanical breakdown might cause a loss of 25 to 50 percent in current production. To them I would say there are at least two low capacity continuous-type mining machines presently available which can produce 30 to 40 tons per man-day operating with a two-man crew, involving a considerably larger number of units, at approximately twice the total capital investment.

MAINTENANCE — While maintenance costs with mechanical equipment of all kinds have been disappointingly high for quite some time in our industry, there is every reason to believe that the cost of labor and supplies to maintain one combination machine will not, and should not, exceed that of three separate pieces of equipment now employed to do the same job. There seems to be proof of that assumption in more than one operation where combination machines are now providing the entire output and where maintenance is well organized.

There was a hint from one manu-

facturer at least recently that parts costs on continuous mining machines will tend to come down in price as more and more machines get into service and the parts production facilities are standardized and streamlined.

Bit costs have come in for much confused discussion, with variations of 1½ cents per ton to 70 cents per ton, three to five cents being more prevalent. It is quite true that the continuous mining machine has to cut a much larger portion of the seam than the conventional cutting and shearing machines, which quite commonly cut in the weakest part of the seam. When obstructions and intrusions were encountered, they pulled out and started over again in another spot. The continuous mining machine has to mine the full seam and take what comes. One must keep in mind also that the modern conventional cutter bit costs about $1.10 whereas the bits which do most of the work on some of the full face continuous miners are of the compound type and cost from $10 to $18 each. There is still a large field of endeavor waiting to be tackled from both the design and metallurgical angle in providing the industry with a satisfactory cutting bit.

VENTILATION — The conditioning of atmosphere at the face is a problem which up to the present time has been resolved in the conventional manner. Where a gaseous condition exists, rib curtains are maintained and advanced with the machine, the intake air current being brought in over the machine and carried back out behind the curtain.

Dust volatilized in the process of mining varies with the nature of the coal and the speed of the cutting element employed, and is knocked down quite generally with banks of high pressure, atomized water sprays, either with or without the use of a "wetting" agent to break surface tension. Any excess dust is drawn behind the curtain by the air current and in some instances settled out further in a crosscut or adjoining place with additional sprays.

Experimental equipment has been built and tried in an effort to collect the dry dust by exhaust from the face atmosphere as it is made and eliminate it entirely. The solution is not yet in sight.

So far, there does not appear to be any disturbing increase in methane emission due to the rapid advance of the continuous miner into solid coal. Possibly the machines have not been used in highly gaseous areas. Exploration into the possibility of draining methane from coal seams in advance of mining may contribute much to overcoming the problem of dealing with it in continuous mining. The degree of interest displayed by the industry in making funds available for research will determine what progress is made in this direction.

FLEXIBILITY — The term "flexibility" implies the ability of a machine to maneuver from place to place, around 90° turns and in narrow places, move into and out of a place with ample clearance, horizontally and vertically. All continuous mining machines developed so far offer this flexibility, but to a greater or lesser degree. This degree is tied to capacity. The more flexible machines are of the "intermittent" type, mining only part of the face at one time, with a cycling type of operation, proceeding from rib to rib, or from roof to floor. Their potential capacity is low,

You can anticipate an increase in maintenance supply costs. However, it is possible that parts prices will come down as more machines are marketed

varying from less than one to not more than two tons per minute with the thickness of the seam.

The less flexible machines are the full-face, or true continuous type miners, whose potential capacity of three or more tons per minute is marked by constant production and a steady advance. To benefit from this characteristic and potential to the maximum degree, it is highly desirable that these machines continue to advance in a straight line with a full face as much as possible. The mine layout or projection should be planned with that thought in mind. Some of these machines now in service are working 80 percent of the time on turns or part face.

This item of "flexibility" will become less important as mining methods and projections gradually depart from the conventional practices of the past.

POWER—Everyone familiar with power requirements involved in the change-over from hand to mechanical loading, knows that ample power, a maximum face voltage, and large feeder capacity are a "must" for successful operation. The same is true and even more so with the concentration of all mining and equipment in one place, operating at peak demand through most of the shift. Adequate power must be provided and deserves first consideration in the planning of a continuous mining installation. Oddly enough, the total horsepower requirements of a continuous mining unit are less than those of a conventional unit, but the horsepower per man employed rises substantially.

Four continuous mining machines now in service in U. S. coal mines are equipped for ac power, both 220 and 440 v. Six others are in foreign countries working on 380 and 500 v. Unfortunately, there is no information as yet available on efficiency, power, and maintenance costs for comparative purposes.

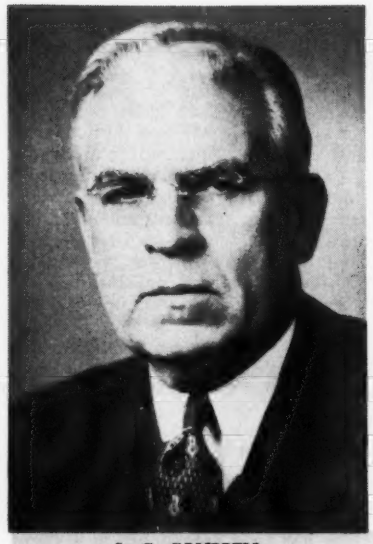
Substitution of hydraulic for electric power throughout the face machine has been approached in a vague sort of way, but has so far met with discouragement due to difficulties in transmission and distribution.

PERSONNEL—The purpose of combining cutting, drilling, blasting, and loading into one operation is cost reduction. Since national labor policies and trends do not seem to favor any leveling off of the wage rates of labor employed in the industry, it stands to reason that costs can be reduced only by a reduction in the number of men employed. Too much emphasis cannot be placed on the need for operating a continuous mining unit initially with the irreducible minimum number of men. Selection of qualified and capable men as far as normal industrial relations permit, and their careful training in the use of the equipment and methods are a highly important phase of the preliminary approach. Versatility of every crew member, and their attendance with utmost regularity become extremely important.

Costs

CAPITAL INVESTMENT — There has been some hesitancy to embrace the principle of continuous mining because of the initial investment involved. The price placed on combination machines by the manufacturer has discouraged rather than encouraged ready acceptance by the industry. He can, of course, expect loading and cutting machine sales to fall off in direct ratio to their replacement with combination machines. However, the desire of the manufacturer and labor both to share with the operator in the profits realized from the improved productivity must be tempered with compassion for the coal consumer. Unless his interests are served, there will be no productivity at all, and no profit for anybody. La-

(*Continued on page 88*)



L. C. CAMPBELL
Vice-President
Eastern Gas & Fuel Associates
Chairman, Coal Division

R. E. SALVATI
President
Island Creek Coal Co.
Chairman, Program Committee

JOHN P. COURTRIGHT
President
Marion Power Shovel Co.
Chairman, Manufacturers Division

WHEN more than 10,000 coal mining men gather in Cleveland's Public Auditorium for the 1953 Coal Convention and Exposition, they will be taking part in the biggest and best Coal Show ever staged. The four days from May 11 to 14 will be devoted to penetrating analyses of current problems and of means whereby coal can continue to fulfill its paramount role — supporting the nation's economy — in these troubled times. Emphasis in convention papers will be laid on improved equipment and operating methods to permit increased efficiency and high production of quality fuel and chemical raw materials. In the exhibition halls, the manufacturers and suppliers to the coal industry will show practically everything in the equipment line for present-day mining operations.

Comprehensive Program Set

An energetic and effective committee under the leadership of Raymond E. Salvati, presi-

HOWARD I. YOUNG
President
American Zinc, Lead & Smelting Co.
President, American Mining Congress

This year, as in the past, the Coal Show of the American Mining Congress to be held in Cleveland, May 11-14, will be the site at which thousands of mining men will take stock of the industry's progress in the past year and get a bearing on the future. The greatest coal exposition ever assembled will present practically everything that progressive manufacturers have to offer for safe, economical coal mining and preparation. An outstanding Convention Program will highlight operating techniques and new equipment to aid in meeting mine production problems and lowering costs. This is truly a great educational opportunity, not only for those in coal mining but for those from the metal and nonmetallic mineral mines as well. I sincerely hope you will set these dates aside and be with us.

Howard I. Young

Coal Goes To Cleveland

To Attend American Mining Congress 1953 Coal Convention and Exposition

dent, Island Creek Coal Co., has arranged a splendid program. Leaders in their respective fields of coal mining and preparation, management and labor relations, have worked up numerous papers presenting the latest and best ideas in the industry.

Convention sessions on subjects of general interest and those dealing with problems of deep mining will be held in the mornings. Special sessions on strip mine problems will be held on Tuesday and Wednesday afternoons, while Monday and Thursday afternoons will be completely open to allow uninterrupted inspection of the exhibits.

On Monday morning, May 11, the opening session of the convention will deal with roof support and pillar extraction. Tuesday morning's session will deal with the problems of underground mechanical mining and safety.

The first special strip mining session will be held on Tuesday afternoon, at which there will be two panel discussions dealing respectively with coal and overburden haulage and bucket and dipper trends.

On Wednesday morning one session will deal

with problems of management and labor relations while another will be devoted to underground haulage and power. Wednesday afternoon's strip mining session will be devoted to a symposium on high-wall drilling.

On Thursday morning one session will deal with continuous mining while the other will cover the coal preparation field. Details of all the sessions are given in the final program printed on pages 58-59.

Exposition Tops

Manufacturers of machinery and suppliers of tools and equipment for modern mining have surpassed all their previous efforts in putting before the convention visitors the most impressive and complete mining exposition ever staged. More than 250 of them will have on display a whole range of products from tiny electronic gadgets to huge drills and trucks too big to get inside the Auditorium's spacious exhibit halls. Many exhibits will feature full size machines in operation and at some, visitors will be permitted to man the controls. A number of brand new units never displayed before will be introduced at the 1953 Coal Show. Trained engineers and technicians will be on hand to answer questions, explain the operation of their equipment and to help solve mechanization problems. Visitors will have an unparalleled opportunity to complete their education in what's new in modern mining.

Many metal and nonmetallic mineral mining companies, as well as those whose primary interest lies in the production of coal, have established the custom of sending not only the representatives of top management but also their superintendents, foremen, maintenance men, and other key employes to Cleveland to see the exhibits and take part in the convention sessions. That the practice pays off, in increased appreciation of how problems are solved at other properties and in renewed enthusiasm for the job at hand, is evidenced by

Session and Panel Chairmen

L. C. Campbell
Eastern Gas & Fuel Associates

F. W. Chesney
Shen-Penn Production Co.

W. J. Crawford
Enos Coal Mng. Co.

Milton H. Fies
Alabama Power Co.

Carl T. Hayden
Sahara Coal Co.

E. R. Price
Inland Steel Co.

James D. Reilly
Hanna Coal Co.

R. E. Salvati
Island Creek Coal Co.

Bradley Sparks
W. G. Duncan Coal Co.

H. A. Treadwell
Chicago, Wilmington & Franklin Coal Co.

C. E. Walker
Jewell Ridge Coal Corp.

the increasing numbers who attend each succeeding Coal Show.

The Royal Road to Fun

After days spent in the meeting rooms and at the Exposition, mining men and their ladies will be ready for some fun and relaxation. With this in mind a full program of entertainment and social events has been planned.

R. G. Pfahler
Chairman,
Floor Committee

When the Cleveland Indians play the Chicago White Sox in a night game on Monday, May 11, there will be thousands of rooters for both teams in the section of the stands reserved for those attending the Coal Show. Mining men are ardent baseball fans, and demand for tickets to this event has been extremely heavy. Better not wait to order tickets.

C. E. Hugus
Chairman,
Welcoming Committee

The Coal Miners Party is scheduled for Tuesday evening. This traditional social evening will provide more fun than ever before. A fine dinner, refreshments, music for dancing and a whopping floor show, plus the good fellowship of other mining people, will make this an evening not to miss.

According to custom, Wednesday evening has been left open. This "breather" gives everyone a chance to look up old friends, spend some time in

(Concluded on page 62)

Program Committee

I. N. Bayless
Union Pacific Coal Co.

R. K. Beacham
Ayrshire Collieries Corp.

S. M. Cassidy
Consolidation Coal Co. (Ky.)

H. J. Connolly
Pennsylvania Coal Co.

E. R. Cooper
Jones & Laughlin Steel Corp.

John P. Courtright
Marion Power Shovel Co.

M. B. Crowley
Caterpillar Tractor Co.

F. W. Earnest, Jr.
Anthracite Institute

Harrison Eiteljorg
Morgan Mines, Inc.

Milton H. Fies
Alabama Power Co.

Harry L. Gandy
Elk River Coal & Lumber Co.

A. G. Gossard
Snow Hill Coal Corp.

R. K. Gottshall
Atlas Powder Co.

John Graham
American Steel & Wire Div.

Alex Grant
Buckeye Coal Co.

Cecil M. Guthrie
Sinclair Coal Mining Co.

R. W. Hernlund
Western Machinery Co.

C. E. Hugus, Jr.
Reliance Electric & Engineering Co.

E. E. Jones
Winding Gulf Collieries

C. O. Kane
Armco Steel Corp.

F. P. Kerr
Eastern Coal Corp.

J. C. Keplinger
Hercules Motors Corp.

Hugh B. Lee
Maumee Collieries Co.

H. C. Livingston
Truax-Traer Coal Co.

L. F. Lumaghi
Lumaghi Coal Co.

A. R. Matthews
Pocahontas Fuel Co.

T. F. McCarthy
Clearfield Bituminous Coal Corp.

J. Craig McLanahan
McLanahan & Stone Corp.

L. O. Millard
Link-Belt Co.

Frank E. Mueller
Roberts & Schaefer Co.

Forest J. Nelson
Macwhyte Co.

Frank Nugent
Freeman Coal Mining Corp.

H. H. Pancake
American Car & Foundry Co.

W. J. Parton
Lehigh Navigation Coal Co.

R. G. Pfahler
Berwind-White Coal Mining Co.

James Reilly
Hanna Coal Co.

S. F. Sherwood
Central Indiana Coal Co.

G. A. Shoemaker
Pittsburgh Consolidation Coal Co.

H. H. Smith
National Malleable & Steel Castings Co.

L. N. Thomas
Carbon Fuel Co.

J. E. M. Wilson
The Jeffrey Mfg. Co.

W. A. Wirene
General Electric Co.

Convention PROGRAM

Monday, May 11

10:00 A. M.—OPENING SESSION—ROOF SUPPORT AND PILLAR RECOVERY

Opening of Convention: JULIAN D. CONOVER, Executive Vice-President, American Mining Congress.

Chairman: R. E. SALVATI, President, Island Creek Coal Co.

A Summary of Roof Bolting Developments

E. R. COOPER, General Manager of Coal Mines, Jones & Laughlin Steel Corp.

J. C. HUNTER, Manager, Powellton Coal Co.

HERMAN E. KNIGHT, Division Engineer, Bell & Zoller Coal Co.

Pillar Extraction Under Heavy Cover

R. F. BOWIE, Research & Planning Engineer, Union Pacific Coal Co.

Pillar Extraction in Anthracite Mining

R. M. VON STORCH, Superintendent, Hudson Coal Co.

2:00 P. M.—MANUFACTURERS DIVISION MEETING

Tuesday, May 12

10:00 A. M.—MECHANICAL MINING SESSION

Chairman: CARL T. HAYDEN, Vice-President, Sahara Coal Co.

Maximum Extraction in First Mining

MACK H. SHUMATE, Assistant General Manager, Truax-Traer Coal Co.

Mechancial Mining in Thin Seams

W. J. SHIELDS, Assistant Chief Mining Engineer, Rochester & Pittsburgh Coal Co.

Specifications for Efficient Face Preparation

EMMETT T. LANG, Industrial Engineer, Powhatan Mining Co.

WILLIAM L. HUSK, Chief Engineer, West Kentucky Coal Co.

10:00 A. M.—SAFETY SESSION

Chairman: MILTON H. FIES, Vice-President, Alabama Power Co.

Degasification of Coal Seams

G. R. SPINDLER, Director, School of Mines, West Virgina University.

Coal Dust Sources and Control Underground

JAMES WESTFIELD, Chief, Health & Safety Division, U. S. Bureau of Mines.

Causes and Prevention of Coal Mine Bumps

CHARLES T. HOLLAND, Head, Department of Mining Engineering, Virginia Polytechnic Institute.

H. E. MAUCK, General Superintendent, Olga Coal Co.

2:00 P. M.—STRIP MINING SESSION

Coal and Overburden Haulage—A Panel Discussion

Panel Chairman: F. W. CHESNEY, President, Shen-Penn Production Co.

R. C. GESSEL, Field Engineer, R. G. LeTourneau, Inc.

E. E. HOWARD, Special Representative, Caterpillar Tractor Co.

A. S. MCCLIMON, Manager Sales Development, Euclid Road Machinery Co.

RALPH H. KRESS, Executive Vice-President, Dart Truck Co.

Bucket and Dipper Trends—A Panel Discussion

Panel Chairman: JAMES D. REILLY, Vice-President, Hanna Coal Co.

A. F. BUSICK, Vice-President Engineering, Marion Power Shovel Co.

R. M. DICKEY, Sales Manager Large Machines, Bucyrus-Erie Co.

PAUL V. LARSEN, Chief Engineer of Construction Equipment Division, Electric Steel Foundry Co.

C. J. POLINEK, Assistant to President, Page Engineering Co.

KARL SCHNEIDER, Design Engineer, Harnischfeger Corp.

Wednesday, May 13

10:00 A. M.—MANAGEMENT SESSION

Chairman: L. C. CAMPBELL, Vice-President, Eastern Gas & Fuel Associates.

Fifty Years of Handling Labor Disputes

DR. T. E. LARKIN, Umpire, Anthracite Board of Conciliation.

Central Management vs. Unit Supervisory Control

PAUL WEIR, President, Paul Weir Co.

Stream Sanitation Problems in the Ohio River Valley—A Panel Discussion

Panel Chairman: E. R. PRICE, Manager Coal Properties, Inland Steel Co.

H. F. HEBLEY, Research Consultant, Pittsburgh Consolidation Coal Co.

T. C. CHEASLEY, Assistant to President, Sinclair Coal Co.

J. J. FOSTER, Vice-President, Island Creek Coal Co.

JAMES HYSLOP, President, Hanna Coal Co.

W. L. MCMORRIS, Manager Coal Preparation, Coal Division, U. S. Steel Corp.

L. E. SAWYER, Director of Reclamation, Indiana Coal Producers Association.

10:00 A. M.—HAULAGE AND POWER SESSION

Chairman: C. E. WALKER, Executive Vice-President, Jewell Ridge Coal Corp.

High Capacity Track Haulage

D. H. DAVIS, Vice-President, Mathies Coal Co.

FRANK LA ROCHE, Superintendent, Snow Hill Coal Corp.

A Complete Belt Mine

JOE CRAGGS, Assistant Division Superintendent, Peabody Coal Co.

H. A. JONES, General Superintendent, Carbon Fuel Co.

Reversed Polarity for Mine Circuits

HOWARD B. BUCKINGHAM, Electrical Engineer, Tennessee Coal & Iron Division, U. S. Steel Corp.

ELTON L. PARKER, Mining Section, Westinghouse Electric Corp.

2:00 P. M.—STRIP MINING SESSION

Chairman: W. J. CRAWFORD, Vice-President, Enos Coal Mining Co.

A Symposium on Highwall Drilling

General Problems:

FRED HORNE, Chief Blasting Engineer, Sinclair Coal Co.

Horizontal Drilling:

MARLIN CARTER, Superintendent of Drilling and Blasting, Ayrshire Collieries Corp.

MERLE BUSBY, Drilling Superintendent, Ozark-Philpott Mine

Vertical Drilling:

ROBERT L. AKRE, Superintendent of Drilling and Blasting, Maumee Collieries Co.

G. H. UTTERBACK, Chief Engineer, United Electric Coal Cos.

Thursday, May 14

10:00 A. M.—CONTINUOUS MINING SESSION

Chairman: H. A. TREADWELL, Vice-President, Chicago, Wilmington & Franklin Coal Co.

A Review and Forecast of Continuous Mining

M. H. FORESTER, Vice-President, Pittsburgh Consolidation Coal Co.

H. B. WICKEY, Vice-President, Pennsylvania Coal & Coke Corp.

Continuous Haulage For Continuous Mining

W. B. JAMISON, Vice-President, Jamison Coal & Coke Co.

JAMES D. SUTTON, Electrical Engineer, Clearfield Bituminous Coal Corp.

Remotely Controlled Bore Mining

P. L. ALSPAUGH, Manager Coal Utilization Projects, Carbide & Carbon Chemicals Co.

10:00 A. M.—COAL PREPARATION SESSION

Chairman: BRADLEY SPARKS, General Manager, W. G. Duncan Coal Co.

Mine Operating Factors That Affect Coal Preparation

R. L. LLEWELLYN, Preparation Engineer, Eastern Gas & Fuel Associates.

Anthracite Fine Coal Cleaning at Coaldale Plant

W. T. TURRALL, Supervisor of Preparation, Lehigh Navigation Coal Co.

Fine Coal Cleaning at Island Creek No. 27 Plant

MATHEW TURKOVICH, Supervisor of Preparation, Island Creek Coal Co.

Coal Preparation With New Type Heavy Media Operation

J. B. TAGGART, Vice-President, Wise Coal & Coke Co.

Manufacturers DIVISION

Allen-Sherman-Hoff Pump Co.
Allis Co., The Louis
*Allis-Chalmers Mfg. Co.
Alloy Steel & Metals Co.
American Air Filter Co., Inc.
*American Brake Shoe Co.,
American Manganese Steel Division
American Brattice Cloth Corp.
*American Car & Foundry Co.
American Chain & Cable Co.
*American Cyanamid Co.
Explosives Department
American Mine Door Co.
Anaconda Wire & Cable Co.
Armstrong Coalbreak Co.
*Atlas Powder Co.

Baker-Raulang Co.
Baldwin-Lima-Hamilton Corp.
Barber-Greene Co.
Bearing Service Co. of Pittsburgh
Bird Machine Co.
Bixby-Zimmer Engineering Co.
Bowdil Co.
Bowers Battery & Spark Plug Co.
Broderick & Bascom Rope Co.
*Brown-Fayro Co.
Brunner & Lay Rock Bit Corp.
Bucyrus-Erie Co.

Cambridge Machine & Supply Co.
Carboloy Co., Inc.
Card Iron Works Co., C. S.
Cardox Corp.
Caterpillar Tractor Co.
*Central Frog & Switch Co.
Central Mine Equipment Co.
Centrifugal & Mechanical Industries, Inc.

* Charter Members.

Chicago Pneumatic Tool Co.
Cincinnati Mine & Machinery Co.
Cities Service Petroleum, Inc.
Clarkson Mfg. Co.
Cleveland Worm & Gear Co.
Coal Mine Equipment Sales Co.
Colorado Iron Works Co.
Cross Engineering Co.
Crucible Steel Co. of America

D-A Lubricant Co., Inc.
Deister Concentrator Co.
Deister Machine Co.
Differential Steel Car Co.
Dings Magnetic Separator Co.
Dorr Co., Engineers
Dow Chemical Co., Western Division
Duff-Norton Mfg. Co.
*Du Pont de Nemours & Co., Inc., E. I.

*Edison, Inc., Thomas A.
Eimco Corp.
Electric Controller & Mfg. Co.
Electric Steel Foundry Co.
Electric Storage Battery Co.
*Elreco Corp.
Engineering Syndicate, Ltd.
Ensign Electric & Mfg. Co.
*Enterprise Wheel & Car Corp.
Euclid Road Machinery Co.

Fairmont Machinery Co.
Farmers Engineering & Mfg. Co.
Firestone Tire & Rubber Co.
Firth Sterling, Inc.
Fletcher & Co., J. H.
Flexible Steel Lacing Co.
Flocker & Co., John
Flood City Brass & Electric Co.

Gardner-Denver Co.
*General Electric Co.
*Goodman Mfg. Co.
Goodrich Co., B. F.
Off-The-Road Tire Sales
Goodyear Tire & Rubber Co., Inc.
Gorman-Rupp Co.
Gould-National Batteries, Inc.
Guyan Machinery Co.

Harnischfeger Corp.
Helmick Foundry-Machine Co.
*Hendrick Mfg. Co.
Hendrix Mfg. Co., Inc.
Hercules Motors Corp.
*Hercules Powder Co.
Hewitt-Robins Incorporated
Heyl & Patterson, Inc.
*Holmes & Bros., Inc., Robert
*Hulburt Oil & Grease Co.
Humphreys Investment Co.
Engineering Division

Ingersoll-Rand Co.
International Nickel Co., Inc.

Irwin Foundry & Mine Car Co.
*I-T-E Circuit Breaker Co.

*Jeffrey Mfg. Co.
Johnson-March Corp.
*Joy Mfg. Co.

Kanawha Mfg. Co.
Kansas City Structural Steel Co.
Kennametal Inc.
Kensington Steel Co.
Koehler Mfg. Co.

LaBour Co., Inc.
Lake Shore Engineering Co.
Lee-Norse Co.
Le Roi Co.
Cleveland Division
*Leschen & Sons Rope Co., A.
LeTourneau, Inc., R. G.
*Link-Belt Co.
Long Super Mine Car Co.
Longyear Co., E. J.
Ludlow-Saylor Wire Co.

*McGraw-Hill Publishing Co.
McLanahan & Stone Corp.
*McNally-Pittsburg Mfg. Corp.

Mack Motor Truck Corp.
Macwhyte Company
Marion Power Shovel Co.
Mechanization, Inc.
*Mine Safety Appliances Co.
Mine & Smelter Supply Co.
Mining Machine Parts, Inc.
Mosebach Electric & Supply Co.
Mott Core Drilling Co.
Murphy Diesel Co.
*Myers-Whaley Co., Inc.

Nachod & United States Signal Co.
National Electric Coil Co.
National Malleable & Steel Castings Co.
National Mine Service Co.
Nolan Co.
Nordberg Mfg. Co.
Northwest Engineering Co.

*Ohio Brass Co.
Ohio Carbon Co.
Ohio Oil Co.
Okonite Co.,
Hazard Insulated Wire Works Div.
Oliver Iron & Steel Corp.
Osmose Wood Preserving Co. of America

Page Engineering Co.
Paris Mfg. Co.
Pattin Mfg. Co.
Penn Machine Co.
Peterson Filters & Engineering Co.
*Phillips Mine & Mill Supply Co.
Pioneer Engineering Works, Inc.
Pittsburgh Gear Co.
Pittsburgh Screw & Bolt Corp.
Post-Glover Electric Co.
Precision Chain Co.
Productive Equipment Corp.
Frox Co., Inc., Frank

Quaker Rubber Corp.

Raybestos-Manhattan, Inc.
Reich Bros. Mfg. Co.
Reliance Electric & Engineering Co.
Republic Rubber Div.,
Lee Rubber & Tire Corp.
*Roberts & Schaefer Co.
*Roebling's Sons Corp., John A.
Rome Cable Corp.

*S K F Industries, Inc.
Safety First Supply Co.
Salem Tool Co.
Schroeder Brothers
Sheffield Steel Corp.
*Simplex Wire & Cable Co.
Simplicity Engineering Co.
Southwestern Engineering Co.
Sprague & Henwood, Inc.
Stearns-Roger Mfg. Co.
Sterling Steel Casting Co.
Sun Oil Co.

Tamping Bag Co.
Texas Co.
Thor Power Tool Co.
Tide Water Associated Oil Co.
*Timken Roller Bearing Co.
Tool Steel Gear & Pinion Co.
Tracy Co., Bertrand P.
Traylor Engineering & Mfg. Co.
*Tyler Co., The W. S.

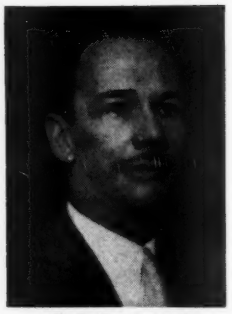
Ultra-Violet Products, Inc.
Union Iron Works
Union Wire Rope Corp.
*United Engineers & Constructors, Inc.
U. S. Rubber Co.
Mechanical Goods Div.
Electric Wire & Cable Div.
*U. S. Steel Corp.

Vascoloy-Ramet Corp.
Victaulic Co. of America
Vulcan Iron Works Co.

Wedge Wire Corp.
*Weir Kilby Corp.
Western Cartridge Co.
Western Machinery Co.
Western Precipitation Corp.
Western Rock Bit Mfg. Co.
*Westinghouse Electric Corp.
West Virginia Steel & Mfg. Co.
White Motor Co.
Sterling Div.
Winter Weiss Co.
Yara Engineering Corp.
Interstate Equipment Div.

P. D. McMurrer
Assistant Director

Julian D. Conover
Convention and Exposition Director



G. B. Southward
Program Director

old-fashioned visiting, swap yarns and make a host of new friends.

As a fitting climax to Coal Show Week, the King Coal Theatre in true AMC tradition will feature a king-size show. Ray Middleton, star of "South Pacific" and "Annie Get Your Gun"; Kirsten Kenyon, Guen Omeron, Norval Campbell, Ray Mason, the Choralaires, a 30-piece orchestra and several specialty acts will combine forces in the Sigmund Romberg-Stephen Foster Show. Everyone remembers the glorious music of "Blossom Time," "The Student Prince" and "The Desert Song." Everyone loves the gay and sentimental melodies of Stephen Foster—as American as the Statue of Liberty. This will be a never-to-be-forgotten production.

Curtain time will be 8:45—plenty of time for pre-theatre dinner parties and no one should miss the thrilling opening.

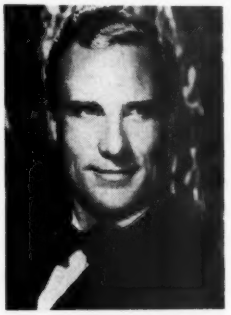
For The Better Half

Ladies who have been to previous Coal Shows know what Cleveland has to offer by way of shopping facilities and civic attractions. Those who are coming for the first time have a treat in store. Both, of course, are welcome at all the regular Convention sessions, the Exposition, and the evening functions. A series of afternoon events has been planned especially for their entertainment.

Lucille La Chapelle will be featured speaker at the Welcoming Luncheon at the Statler on Monday. Here, Miss La Chapelle will have the ladies chuckling as she demonstrates her theme, "You are better than you sound."

Cleveland Art Museum's famous "May Show" will be in progress when the ladies visit the museum on Wednesday afternoon. A personally conducted tour including the museum's beautiful gardens, where the cherry trees will be in bloom, will be followed by tea. Only a limited number can be accommodated, so get your tickets early.

Mere man cannot hope to do more than appreciate the results of his "Better Half's" preoccupation with the details of fashion. In deference to this interest a special showing of summer fashions staged by the Higbee Co. of Cleveland has been arranged for Thursday afternoon in the Ballroom of the Hotel Cleveland. There will be a luncheon and awarding of really worthwhile door prizes just before the fashion parade begins. Here again, time is of the essence when it comes to tickets. Don't be left out! Order them early.



★

RAY MIDDLETON

Broadway star of "South Pacific" will headline the two colorful musicales to be presented in a "king-size" show on Thursday evening.

Made Reservations Yet?

More than 10,000 are expected to register at the Coal Show. Although the Housing Bureau has promised comfortable rooms for all, requests for hotel accommodations should be in early. Requests should be made to the Cleveland Housing Bureau, 511 Terminal Tower Building, Cleveland 13, Ohio. Those who plan to come by car should take advantage of the many fine motels in and near Cleveland. Reservations for these may be made direct or through the Housing Bureau.

In these pages we have tried to give an outline of what's in store for the thousands who attend the 1953 Coal Convention and Exposition. But words cannot do justice to the reality. The Coal Show must be seen and experienced to realize its full import. You'll be glad you came to Cleveland, May 11 to 14.

• THIS is a preview of the greatest Coal Show ever. The exhibitors' displays will cover more than 130,000 net sq ft in the six exhibition halls of the Auditorium, with outside exhibits on the Mall. To make your visit to the Coal Show pay the maximum dividends, study the exhibits carefully and talk things over with the experts.

• ACME MACHINERY CO.

Plans to exhibit a rubber-tired mine compressor, a 420-cu ft stationary compressor, a complete line of roof bolting stopers and impact wrenches. Featured in the display will be an entirely new rotary stoper and a brand new, Government approved dust collector adaptable for use in coal seams from 36 in. to eight ft in height.

• AERO SERVICE CORP.

Exhibit will show how air surveys work for the strip industry. Typical air surveys will be displayed, along with information on how they can be used to estimate coal acreage, to delineate crop lines, to plan rail spurs and redevelopment, to plot bore holes and property lines, to inventory timber, to compute overburden, and to aid geologic study. *In charge—George L. Hess.*

• AEROQUIP CORP.

Will exhibit their standard line of flexible hose and self-sealing couplings. The Aeroquip flexible hose with detachable, reusable fittings matched for performance allows the user to make up his own hose lines as required. Self-sealing couplings allow fluid carrying lines to be disconnected without a loss of fluid and reconnected without inclusion of air. In addition to the standard line of products, Aeroquip will introduce many products new to coal mining. *In charge—M. W. Brandau.*

• AHLBERG BEARING CO.

Will feature their various types of bearings and pillow blocks set in plastic globes mounted on a large circular plastic plate and indirectly illuminated through louvers in the base. *In charge—R. L. Schutte.*

• ALEMITE DIVISION
Stewart-Warner Corp.

Will exhibit centralized lubrication systems, Versatal spraying equipment and a Model 6687 mine car gun. The mine car gun, which is available in special voltage, current and cycle motors, is used widely in the mining industry. Versatal spraying equipment is capable of using materials directly from the original container to the point-of-use, eliminating wasteful handling. Centralized lubrication systems in either oil or grease make possible the lubrication of many vital points of machinery from one central point. *In charge—Lee H. Gwynne.*

• ALLIS-CHALMERS MFG. CO.
General Machinery Division

Equipment on exhibition includes a 4 by 16-ft single-deck "Low-Head" screen; 5 by 12-ft double-deck "Ripl-Flo" screen with "Thermo-Deck" heating unit; 6 by 6-in. centrifugal pump; one-quarter scale operating model of a

10 by 8-in. solids-handling pump, and a display of motors, controls and "Texrope" drives. *In charge—R. N. Brown.*

• **ALLIS-CHALMERS MFG. CO.**
Tractor Division

Will show as exhibit feature the TS-300 motor scraper, a recent addition to their line. Other equipment displayed will be the HD-20G crawler tractor, the AD-40 motor grader and the HD-15G.

A special display will depict in photographs the part Allis-Chalmers plays in the modernization of coal hauling and coal mining. *In charge—A. E. Dorn.*

• **AMERICAN AIR FILTER CO., INC.**

Will display regular size working models of their Type N Roto-Clone and Type W Roto-Clone dust collectors. Both Roto-Clones are combination exhausters and dust collectors used extensively in coal mining operations to control dust from crushing, screening, drying, material handling and air cleaning processes. *In charge—John Liskow.*

• **AMERICAN BRATTICE CLOTH CORP.**

Will display two model Inflatable Brattices and pictures showing these units in coal and metal mines. Also displayed will be ABC's seven kinds of Brattice Cloth and Ventilation Tubing. *In charge—D. Blaine Mikesell.*

• **AMERICAN CAR & FOUNDRY CO.**

Plans to display a large capacity, all steel, eight-wheel, drop-bottom, mine car. Various sizes of ACF lubricated type plug valves and a moving picture showing ACF mine car in service will complete the exhibit.—*In charge—F. J. Bogard.*

• **AMERICAN CHAIN & CABLE CO., INC.**
American Cable and Hazard Wire Rope Divisions

Will exhibit a complete line of wire rope for coal mining. Their Green Strand preformed wire rope and their Boom Cable assemblies will be featured. *In charge—W. W. Runkle.*

• **AMERICAN CYANAMID CO.**
Explosives Department

Exhibit will feature the American Container-Cartridge designed for deep and strip mining applications. In addition, the display will include the entire American line, including a new line of plastic wires. Over-all theme will stress company's research program toward safer, more economical blasting. *In charge—H. I. Phemister.*

• **AMERICAN MANGANESE STEEL DIVISION**
American Brake Shoe Co.

Will feature castings of "the toughest steel known" and hardfacing applications in the coal fields. Visitors will see a coal pulverizer fan blade cross-hatched with hardfacing to provide minimum contact between dust and blade, a reclaimed tractor roller, patented Wearshop dipper tooth repointers which keep a straight digging edge as they wear, as well as the regular line of repointers and dipper teeth. Castings on display also include a cable-saving sheave and a hardfaced scraper blade. *In charge—Harry D. Sweeney.*

• **AMERICAN MINE DOOR CO.**

Exhibit will consist of three items: A track cleaner weighing 8000 lb with special features to make good housekeeping easier and safer; the Midget Duster for rock dusting; an automatic switch thrower which throws switch in advance of an approaching trip. *In charge—Charles Vignos.*

• **AMERICAN MINE SUPPLY CO.**

No description available.

• **AMERICAN PULVERIZER CO.**

No description available.

• **AMERICAN WHEELABRATOR & EQUIPMENT CORP.**

Will feature a cut-away model of an actual full-sized No. 5 Model 112 Dustube Dust Collector. This unit will be complete with rotary valve and screw conveyor.

It will be exhibited so that visitors may walk inside the filtering compartment to observe its operation.

Photographs of various installations in the coal and coke industry where the Dustube is used will be on display. An adequate staff of engineers will be on hand. *In charge—R. T. Pring and L. L. Andrus.*

• **ANACONDA WIRE AND CABLE CO.**

Exhibit will be composed of six sections. Main feature will be a complete description of the new shuttle car cable. Each of the five other sections will show by a diorama the application of various types of wires and cables used in the coal mining industry. *In charge—C. B. Peck, Jr.*

• **ARMCO DRAINAGE & METAL PRODUCTS, INC.**

Will exhibit a full scale tunnel liner, fan duct and explosion door, steel sheeting, Flex-Beam guardrail and a model Steelox building. Kodachrome transparencies of these products in use, and a large air-view photo mural of a coal mine with other enlargements showing exact uses of company's products will round out the exhibit. *In charge—W. H. Spindler.*

• **ASHLAND OIL AND REFINING CO.**

Plan to have a joint exhibit with Freedom Valvoline Oil Co. Coal spray oils and mine lubricants, both Ashland and Valvoline, will be featured at the Ashland-Valvoline display. Hugh Jenks, head of the coal spray department, and a number of others, from both Ashland and Valvoline, will be present. Exhibits in connection with coal spray will show photographically the application and use of coal spray oils. *In charge—Don McKee.*

• **ATLAS POWDER CO.**

Will display photographic evidence of increased efficiency of Rockmaster blasting methods. Both motion pictures and sequence photos will be used. The exhibit will attempt to give "The Inside Story" on blast hole detonation. The sequence photographs will be by the Atlas machine-gun camera which has proven of great help in analyzing blast action. *In charge—Joseph H. Dannenberg.*

• **AUSTIN POWDER CO.**

Will, with Central Mine Equipment Co. and Firth Sterling, Inc., exhibit a complete line of auger drilling equipment including all types of coal augers, roof augers, and strip mine augers; also a complete line of tungsten carbide cutting machine bits and drill bits for both underground mining and strip mining. Also shown will be a line of throaway percussion bits and drill steel. *In charge—Neil Baker.*

• **BAKER RAULANG CO.**

See J. H. Fletcher & Co.

• **BALDWIN-LIMA-HAMILTON CORP.**
Construction Equipment Division

Will exhibit large colored photographs, depicting Lima shovels, cranes and draglines as applied to the coal mining industry. Shovels are built in capacities ranging from ¾ to six-cu yd capacity. Dragline capacities are variable,

depending on boom length. Cranes are available up to and including 110-ton capacity. All machines are adaptable to strip mining and can be equipped with various length booms, dippers and dipper handles to meet stripping conditions. Cranes on rubber are available in capacities up to and including 35 tons. Bulletins will be available on all types. *In charge—Roy K. Wills.*

• **BARBER-GREENE CO.**

Exhibit will consist of a section of B-G Channel Frame Mine Conveyor, and a conveyor idler display stand.

Advantages of completely standardized conveyor components will be illustrated in the assembled conveyor section, complete with carriers and return rolls.

A display stand with standard, self-aligning and rubber impact carriers, rubber tire and chevron rod self-cleaning return rolls will provide a realistic insight into the design and scope of Barber-Greene Conveyor Idlers.

Adding to the display will be a background with colored photo murals and transparencies of Barber-Greene mining equipment. *In charge—H. W. Newton.*

• **BEARING SERVICE CO.**

Will display special ball and roller bearings made in their own plant in Pittsburgh. Most important to mine operators is the company's 30 years' experience in servicing the mining industry. Trained bearing engineers will always be available to help mining men with maintenance problems. *In charge—P. H. Boone.*

• **BEMIS BRO. BAG CO.**

Will show heavy duty grade (canvas base) and Jute grade "Flexipipe," a collapsible tubing for mine and tunnel ventilation. The display will illustrate the sewed-in type of coupling, the detachable coupling, various methods of suspension, and accessories. Descriptive literature and samples will be available. *In charge—I. D. Teter and D. L. Lorimier.*

• **BETHLEHEM STEEL CO.**

Exhibit will be devoted to products for safer mining and faster haulage. Featured in the display will be: mine roof bolts; prefabricated mine track work; custom designed mine cars; forged mine car wheels; wire rope for underground and surface operations and hollow drill steel for rock drilling. *In charge—R. W. Saunders.*

• **BIRD MACHINE CO.**

Will present one of the larger sizes of the Bird "Polisher," similar in appearance and construction to the Bird Coal Filter but specifically designed to solve the problem of circulating coal cleaning water to avoid stream pollution and need for sludge ponds.

An added feature of the exhibit will be a pictorial display of Bird Coal Filter installations in many well known preparation plants. *In charge—F. X. Ferney.*

• **BITUMINOUS COAL INSTITUTE**

Speaking for the National Coal Association, of which it is the public relations department, BCI in its exhibit will spotlight the many channels of communication—national advertising, press releases, motion pictures and slide-films, a speakers' bureau, coal exhibits at teachers' conventions and at industrial shows, coal programs on radio and television, industry-sponsored teaching aids, booklets, annuals, leaflets, maps and charts—being employed to increase public regard for the industry and the product. *In charge—T. A. Day.*

• **BIXBY-ZIMMER ENGINEERING CO.**

Will feature a scale model vibrator in operation showing method of mounting and use of Bixby-Zimmer round rod all-welded stainless steel screens. *In charge—Ray L. Kaga.*

• **BLACKHAWK MANUFACTURING CO.**

Will display hydraulic hand jacks, portable hydraulic equipment and service tools. *In charge—John H. Allen.*

• **BOSTON WOVEN HOSE & RUBBER CO.**

Exhibit will focus attention on B. W. H. rubber products specifically designed, engineered, and constructed to meet the highly specialized mechanical rubber needs of the coal mining industry. Paramount among these rubber items is conveyor belt. Emphasis in the B. W. H. exhibit will center on conveyor belt and the B. W. H. method of manufacture. This method will be demonstrated on a model of Boston's exclusive Rotocure press. Also emphasized will be V-Belts and rubber hose. *In charge—Ben Gooding, Jr.*

• **BOWDIL CO., THE**

Will show its 1-29 Heavy Concave Bit and an improved version of the Bowdil fabriforged Cutterchain. *In charge—F. T. Bowman.*

• **BOWERS BATTERY & SPARK PLUG CO.**

Will exhibit a complete line of mine locomotive and shuttle car batteries. A feature of the exhibit will be a part-by-part display of the components of a storage battery. Also highlighted in the exhibit will be a presentation of the Bowers 5-Clad Insulation—a special feature incorporated into all mine locomotive and shuttle car batteries. There will be a sales and engineering staff at the exhibit. *In charge—"Jac" Jaccard.*

• **BRODERICK & BASCOM ROPE CO.**

Will display literature and samples covering wire rope and slings used in the mining field. These will include underground ropes, hoist ropes, and machine ropes for deep mines. There will also be samples of large shovel ropes up to and including four-in. diam.

There will also be a complete display of Yellow Strand Braided Safety Slings for use in mine and shop. *In charge—James P. Shaffer.*

• **BROWN-FAYRO CO., THE**

Exhibit will feature:

The new "Brownie" Model HS-15 Hydraulic Car Spotter for use in moving trips of mine cars past any loading point where loading rates are high and it is important to avoid stoppages for changing cars or trips.

A high pressure "Cold Oil" Spray Outfit, designed for maximum performance in the dust-proofing and freeze-proofing of coal.

A new Surflo Foot Valve and Strainer, particularly adapted for mining service. *In charge—Fred M. Davis.*

• **BROWNING DUST COLLECTOR**

No description available.

• **BUCYRUS-ERIE CO.**

Bucyrus-Erie's exhibit will be a photographic presentation of machines used in the coal industry. These will include walking draglines, stripping shovels, loading shovels, blast-hole drills, tractor equipment and the Hydrocrane. A scale model of the 6-yd, 150-B shovel which operates electrically from a standard set of controls will be shown in action. Of particular interest to visitors will be a photograph (or photographs) of the new 50-R rotary blast-hole drill. *In charge—H. A. Burkhardt.*

• **BUDA CO., THE**

Exhibit features three supercharged Diesel engines equipped with torque converters for powering haulage equipment and shovels used in strip mining operations. Also on display will be a Diesel electric generator set—suitable for furnishing electric power, both emergency and

regular, for operation of ventilating fans, lighting and other equipment. All of these engines are new in that they are especially designed with torque converters. One is a brand new engine just going into production. *In charge—H. H. Cohenour and R. Lunn.*

• **BURNDY ENGINEERING CO., INC.**

Will present a broad cross section of the Burndy solderless connector line—emphasizing time and cost savings, as well as the additional safety factors of compression or mechanical connectors versus old fashioned soldering. *In charge—James J. Hennessey.*

• **CALCIUM CHLORIDE INSTITUTE**

Exhibit will contain material illustrating the uses of calcium chloride in the coal industry. Literature will be available for all visitors and technical personnel, familiar with calcium chloride and its uses in the coal industry, will be on hand to answer questions of visitors. *In charge—Wm. F. Reynolds.*

• **CARBOLOY DEPARTMENT OF GENERAL ELECTRIC CO.**

Exhibit will contain the complete line of Carboloy mining tools—including those recently developed. Carboloy permanent magnets used in the separation of tramp iron from coal will be displayed. Information will be available on the various customer services offered by the Carboloy Department. These include the customer training school, the field service organization and the new mining catalog with maintenance instruction manual. *In charge—W. S. Baker.*

• **CARDOX CORP., THE**

Exhibit will feature the Surface AugerMiner and a new high capacity Underground AugerMiner. This new equipment offers a practical answer for many mines where conditions make conventional mining methods unprofitable or unsafe. The exhibit will also include an Airdox unit as well as a line of vertical drilling equipment. *In charge—Fred O. See.*

• **CARLON PRODUCTS CORP.**

Display will be built about six large transparencies which will show Carlon plastic pipe in mine use. Carlon's molded plastic fittings will be available for inspection. *In charge—E. S. Moreland.*

• **CATERPILLAR TRACTOR CO.**

Featured in the display is the No. 6 Shovel, a new product introduced March 17.

This new shovel will be among 12 Caterpillar units along with the several special attachments that will be shown in the exhibit. *In charge—Charles Beck.*

• **CENTRAL MINE EQUIPMENT CO.**

See Austin Powder Co.

• **CENTRIFUGAL AND MECHANICAL INDUSTRIES, INC.**

Are going to exhibit a 36-in. continuous centrifugal dryer. This machine will be an actual field model enroute to a customer. However, there will be some lighted and colored cutaway sections to point out various working parts and their fundamentals. Also on exhibit will be some of the individual parts such as the baskets, screens, flights, etc., plus some photographs of machines in actual operation. *In charge—P. W. Bigley.*

• **CHAIN BELT CO.**

A series of pictures consisting of "on-the-job" enlargements of Chain Belt Co. products and their application in the coal mines will make up the background.

Samples of various transmission and conveyor chains will be on display. A Rex Troughed Belt Idler with a spiral return will be shown along with a cutaway view of one of the idler rolls.

A small Rex portable plastic centrifugal pump will actually be pumping water in the Rex Booth. *In charge—Fred Pampel.*

• **CHICAGO PNEUMATIC TOOL CO.**

Electric and air-operated roof bolting equipment will be featured.

The all-electric Model RBD-30 Mobile Roof Bolting Unit drills bolt holes and sets the bolts without repositioning the machine. The unit weighs 575 lb, is 28 in. high, and adaptable to high or low seams.

The new CP-134 Short Stoper and a CP Impact Wrench air-powered roof bolting combination with four stoper models permits steel changes of 12, 18, 24 and 36-in. Available in wet or dry types.

Other equipment exhibited will be the complete line of permissible hand-held, post-mounted, and mobile drills.

• **CINCINNATI MINE MACHINERY CO., THE**

Exhibit will consist of a display of typical cutter-chains, cutterbars, sprockets and cutterbits made by "Cincinnati" for use on all types of cutting machines. Enlarged action pictures and a novel lighting arrangement will also be included. *In charge—John R. Cartlidge.*

• **CITIES SERVICE PETROLEUM, INC.**

Exhibit will feature a complete line of specially processed oils designed to lubricate all types of coal mining machinery.

The Cities Service Heat Prover will be in operation at the exhibit demonstrating the unique instrument features that make it a valuable tool for the control of industrial combustion processes.

There will be a diorama on display, illustrating marketing facilities whereby petroleum products for industry, farm, air and home are made available to the consumer. *In charge—L. H. White.*

• **CLARKSON MANUFACTURING CO.**

Plan to show one type 20FA 30-in. mobile rubber-tired heavy-duty loading machine either single or dual rubber equipment hydraulically controlled—One motor capacity 8 to 10-ton per minute. Clarkson Redbird Hevi-Duti Conveyor Chains and universal flights for all mobile equipment. *In charge—Clyde E. Clarkson.*

• **CLEVELAND WORM & GEAR CO.**

See Farval Corp.

• **COAL AGE**

Will have its complete staff available for consultation. *In charge—R. W. Davis.*

• **COAL & MINERAL WASHER CORP., THE**

This company and Robert A. Cummings, Jr. & Associates (Aerial Mapping Surveys) will have a joint exhibit showing the Nichols Freeman Vortrap removing particles from water, Pettibone Mulliken slurry pump and a demonstration showing the use of aerial mapping and equipment as applied to mining. Literature will also be available on the Bulkley Dunton Process's system "Colloidaire," used to remove colloidal material from water. *In charge—Robert A. Cummings, Jr.*

• **COAL MINE EQUIPMENT SALES CO.**

Deals in used mining machinery of all types, and will have lists, circulars, and photographs of available equipment. *In charge—Frank J. Wolfe, Sheldon J. Wolfe, and James C. Lindsay.*

• **COFFING HOIST CO.**

Will display safety pull ratchet lever hoists, hoist-all, mighty midget puller, coil chain safety pull ratchet lever hoist, Quik-Lift electric hoist, and Challenger spur-geared

hoist. All this equipment is portable for hoisting, lifting and pulling. *In charge—Don Wallace and Mike Crowder.*

• **THE COLORADO FUEL AND IRON CORP.**
Wickwire Spencer Steel Division

Will have engineers and salesmen on hand to assist visitors with their wire rope, screening and roof bolt problems. *In charge—George C. Jennings.*

• **COMBUSTION ENGINEERING-SUPERHEATER, INC.**
Flash Dryer Division

Exhibit will feature a working model of the C-E Raymond Flash Drying System for fine coal. Through the use of plastics this model will show the latest developments and improvements in action.

Complete operating data on the many C-E Systems in use will be available. *In charge—C. W. Gordon.*

• **COMPTON, INC.**

Will present in an outdoor exhibit the latest model 32 Compton Auger to the mining industry. The new machine incorporates many innovations, such as: an integral conveyor with turret discharge chute; roller bearing supports for augers; drum and cable drive; pilot and spillage pan; swiveling pontoons, overhead hoists; and patented high speed cutter heads. Feature of their indoor display will be examples of the latest in design of high speed cutter heads. *In charge—D. M. Bondurant.*

• **CONNELLSVILLE MFG. AND MINE SUPPLY CO., THE**

Will feature equipment used in handling coal from mine car to railroad car, such as rotary mine car dumpers, sheave wheels, skips, cages, feeders and related equipment. Literature will be provided. *In charge—E. F. Charlton.*

• **CUMMINGS, JR. & ASSOCIATES, ROBERT A.**

See the Coal & Mineral Washer Corp.

• **CUMMINS ENGINE CO., INC.**

Will feature cutaway models of the diesel engines they manufacture. For one of these the 200-hp NHHB-600 this will be a premiere showing. Also a feature attraction will be the 550-hp NVHS-1200. Plastic windows in both models permit full view of the various working parts in action. *In charge—Russell Ricketts.*

• **D-A LUBRICANT CO., INC.**

Will have a hospitality booth. On display will be heavy duty oils and lubricants manufactured and distributed by this company. There will also be shown the lubrication of a heavy-duty two-speed hypoid differential assembly. Factory representatives will be in the booth at all times to answer any questions or help with any lubrication problems the Coal Show visitors may have. *In charge—R. J. Binford, Jr.*

• **DART TRUCK CO.**

Will exhibit the new Model 145, 60-yd bottom dump coal hauler as well as a newly designed Model 30, 30-ton dump unit.

The newly designed features on the latter truck will include a front axle turning by hydraulic power on a center bearing cushioned by captive air in an hydraulic-air strut; a 300-hp engine side mounted between the front and rear tires, and a smaller engine in the same location on the other side of the frame to power all of the accessory equipment items. *In charge—L. B. Philippi.*

• **DAVIS CO., NELSON L.**

Exhibit will feature a schematic panel showing the operation of a Two-Stage Dense Media Coal Cleaning Plant. Standardized coal cleaning plants in capacities of 50 to 325 tph and custom-built plants will be illustrated in a series of illuminated transparencies, still films, and photographic blow-ups. *In charge—Thomas R. Davis and John G. Cappozzo.*

• **DEISTER CONCENTRATOR CO., THE**

Will exhibit a SuperDuty Diagonal-Deck Coal Washing Table, with one-fourth commercial size deck, but with commercial size Concenco Anti-Friction Bearing Head Motion; a commercial size Leahy Vibrating Screen equipped with FlexElex to electrically heat screen cloth under controlled conditions; a commercial size Concenco 108 Distributor of type employed for equal distribution of feed to batteries of coal washing tables and other apparatus; and Concenco Spray Nozzles of J-132 and J-136 series, in actual operation. *In charge—D. N. Griffin.*

• **DEISTER MACHINE CO.**

Will feature a new coal washing table headmotion. This new Lifetime, Anti-friction bearing headmotion will be an operating unit, connected to a coal washing table deck. They also plan to feature large photographs of Deister Scalping Screens and Carbon Coal Screens, with cross-sectional views of important features. *In charge—Irwin F. Deister.*

• **DEMING CO., THE**

Plans to display a line of pumps for mine use including a double acting mine gathering pump with all bronze water end; a self-priming pump and a cutaway submersible pump. *In charge—Gordon Allen.*

• **DENVER EQUIPMENT CO.**

Will exhibit a complete coal flotation plant which will be in operation recovering waste coal fines. The display will feature the simplicity and low cost of cleaning and recovering coal fines. *In charge—H. J. Gisler.*

• **DETROIT DIESEL ENGINE DIVISION, GENERAL MOTORS CORP.**

Will display two-cycle Diesel engines: A 3-cylinder Torque-Converter unit of the "71" Series, a 6-cylinder Torque-Converter unit of the "110" Series and a "matched pair" of 6-cylinder Series "71" engines also with Torque Converters. In addition a 6-71 motorized cutaway engine will be shown. The display will be manned continuously. *In charge—L. H. Wells.*

• **DIFFERENTIAL STEEL CAR CO.**

Plans to include in its exhibit a small scale working model of the Differential Mine Car Rotary Dumper and Differential 8-wheel "Axless" Truck Mine Car. These are exact duplicates of the live dumper and car for use in the coal mines. *In charge—R. D. Flowers.*

• **DINGS MAGNETIC SEPARATOR CO.**

Exhibit will consist of a colorful backdrop employing blacklight and full size photographs to illustrate the features of the RM Rectangular Suspended magnet. A working scale model of this magnet will demonstrate the protection which the prototype gives to crushing systems at mines and to breakers and pulverizers in coal preparation plants for steam power plants.

Literature and information on other items of magnetic equipment of interest to coal miners and users will be available. *In charge—D. J. Raines.*

• **DODGE MANUFACTURING CORP.**

Will display new Taper-Lock Sprockets for Roller Chain and will be demonstrated along with Taper-Lock V-Belt sheaves, flexible and rigid couplings and a solid steel conveyor pulley.

This conveyor pulley will be sectioned to show internal features of the drum-type construction.

The new Dodge-Timken All-Steel Pillow Block, cutaway to show new features, will also be displayed.

The Dodge Torque-Arm Speed Reducer, equipped with overload release will be dynamically demonstrated. *In charge—Carl Beeke.*

• **DOOLEY BROS.**

Will show a complete permissible Bureau of Mines Approved mobile coal drilling truck with all the latest safety devices. Circuit breakers instead of fuses to protect motors, safety contactor for miners' protection and fuel control of drilling operation from one position on the drill arm. Mobility, safety, ease of operation, lower drilling costs and rugged construction were the foremost thoughts when these drills were designed, manufactured and submitted to the Bureau of Mines for permissible approval. Also, various size post assemblies, repairs and exchange parts of Superior Electric Coal Drills will be displayed. *In charge—A. H. Armitage.*

• **DORR CO., ENGINEERS**

Will display a six-in. diameter DorrClone which went into operation recovering fines on a "destruction test" in early February at an eastern coal cleaning plant. This unit, which will be taken off the line just prior to the opening of the Show, is lined with a special material which has successfully solved the serious wear factor in cyclone operation. For comparative purposes, a new DorrClone, identical with the test unit, will also be shown. *In charge—A. L. Morris and D. C. Gillespie.*

• **DOWTY MINING EQUIPMENT LTD.**

Plan to display their Hydraulic Pit Props (Roof Supports). One of the props will be fully sectioned and cutaway to reveal details of piston, cylinder and relief valves, etc. *In charge—G. Purcell.*

• **DUFF-NORTON MANUFACTURING CO.**

Will display a complete line of hydraulic, ratchet, and screw jacks used by the coal mining industry. Featured will be mine roof jacks used in connection with roof bolting and ten-ton ratchet jacks used to move and repair heavy mining machinery. *In charge—J. F. McCartney.*

• **DU PONT DE NEMOURS & CO., INC., E. I.**

In the DuPont display two departments will be featured —explosives and textile fibers.

Chemecol, a chemical-mechanical method of breaking coal will dominate the explosives exhibit. Also featured will be Nitramon, Permissible explosives and blasting accessories.

Conveyor Belts reinforced with "Cordura" rayon will be the feature of the Textile Fibers Department exhibit. *In charge—J. M. Pierson.*

• **ELECTRIC CONTROLLER AND MFG. CO.**

Will feature several items of electrical equipment. These are: an automatic reclosing sectionalizer for d-c, stub end feeders; E.C.&M. Tab-Weld plate resistors to permit up to 94 taps on low ampere sections to make connections and adjustments readily available; overload relays for a-c motors; and frequency relay magnetic controller for aerial tramway systems. *In charge—J. P. Moore.*

• **ELECTRIC STEEL FOUNDRY CO.**

Will exhibit four new products designed to cut costs and increase production in the coal fields. Largest, newest and most interesting will be a new style heavy-duty dragline bucket featuring a double-tapered basket and all-welded construction.

Other products to be displayed include the new dozer-rooter, a heavy-duty rooter that fits on the mold board of all popular dozers, a newly designed hinge repair link for chains, a long-bowl socket and a new addition to "Esco's" line of points and adapters. *In charge—J. E. McQuaid.*

• **ELECTRIC STORAGE BATTERY CO.**

Will display a new line of Exide Ironclad Batteries designated as the "T-H" line. High spot of the 13-ft high exhibit will be a giant, illuminated, plastic, replica of the new T-H cell. *In charge—George Krauss.*

• **ELRECO CORP., THE**

Will feature a model shuttle car equipped with the new Elreco "Double" Inverted Trolley Slook in operation. This will be the first public demonstration of the system which is a special adaptation of Elreco's Inverted Trolley System for single wire operation. Also shown will be Elreco Smooth Underrun frogs and splicers, J Hooks, roof bolting equipment, trolley sliders and other line material. *In charge—Douglas Parker.*

• **ENSIGN ELECTRIC AND MANUFACTURING CO.**

Consists essentially of control and power distribution equipment for the mining industry. Among the new and novel items on exhibit are: the Ensign-Clark type ADJR Starter; power distribution equipment providing means of sectionalizing power cable between power source and face equipment; and a new Bulletin 1101 Centrifugal Switch USBM explosion tested enclosure. *In charge—W. P. Dickson.*

• **ENTERPRISE WHEEL AND CAR CORP.**

Promises something new in mine cars at their display. *In charge—Robert W. Lahr.*

• **EUCLID ROAD MACHINERY CO.**

Will exhibit a 40-ton, single tire coal hauler along with one of the latest Rear-Dump Euclids.

The Coal Hauler is powered by either a 275-hp General Motors engine or a 300-hp Cummins. It is supplied with either a conventional 10-speed transmission or torque converter and semi-automatic transmission. *In charge—Virgil L. Snow.*

• **FAIRMONT MACHINERY CO.**

Plans a joint display with United Engineers & Constructors, Inc., explaining their services on coal preparation plants. This will be explained from the time of contacting the customer—with details of engineering, fabrication and erection services. Finally, photographs will be shown on complete installations. The "Heart of the Preparation Plant" will again be featured in the exhibit. *In charge—R. W. Decker.*

• **FARMERS ENGINEERING & MFG. CO.**

The Femco exhibit will feature the Trolleyphone for use on mine locomotives. Giant pictures and actual units will be on display. Several units will be wired for testing by visitors. Literature on the company's product will be available and technical representatives will be on hand. *In charge—W. Porter Place.*

• **FARVAL CORP.**

This company and its affiliate, Cleveland Worm & Gear Co., will exhibit Farval Centralized Lubrication equipment, and a Cleveland Worm Gear 300-FA fan-cooled Speedaire reduction unit. *In charge—D. H. Rowe.*

• **FIRTH STERLING, INC.**

See Austin Powder Co.

• **FLETCHER & CO., J. H.**

Have combined forces with Baker-Raulang Co. to display in actual operation the new high speed Baker mine tractor, the Fletcher roof drill combination with timbering attachments, and the all-new Fletcher hydro-shift roof control drill. Special movies will display additional features and equipment, including mine trailers, rubber-tired

mine trikes, and a new line of track equipment. Come in and operate this specialized coal mining equipment. *In charge—Robert and William Fletcher and H. P. Wiseman.*

• **FLEXIBLE STEEL LACING CO.**

Has built an exhibit around their 19-ft incline conveyor. The 24-in. wide troughing conveyor belt will demonstrate the application and use of various belt fasteners. Two new belt fasteners and improved application tools will be introduced. *In charge—Warren B. Poulson.*

• **FLOOD CITY BRASS AND ELECTRIC CO.**

Exhibit will consist of trolley line material, electric switches and mining machine and locomotive parts. Also featured will be Flood City centrifugal and plunger pumps. *In charge—Walter Jacobs.*

• **FOOTE BROS. GEAR AND MACHINE CORP.**

No description available.

• **FREEDOM-VALVOLINE OIL CO.**

See Ashland Oil and Refining Co.

• **FRONTIER BRONZE CO.**

Will feature the Holzworth Aluminum Shaker Conveyor embodying an entirely new design principle. Shaking motion is transmitted from rails to separate unconnected pans. *In charge—A. D. Patterson.*

• **FUEL PROCESS CO.**

No description available.

• **FULTON BAG AND COTTON MILLS**

Will exhibit their F.F.F.F. and Blaze Braker brattice cloth as well as Scotch Seam tamping bags. *In charge—E. M. Hornsby and Chas. W. Webb.*

• **GENERAL CABLE CORP.**

Exhibit will feature Safety Mineral Insulated Wire and a display of their regular line of wire and cable products. Demonstrations will be conducted to show the mineral insulated wire to be fireproof, water tight, condensation free and rugged in structure.

• **GENERAL ELECTRIC CO.**
Apparatus Sales Division
Construction Materials Division
Electronics Division

In an outside booth will feature their track-laying type shuttle car in operation. An inside exhibit will be used to display the GE dc mine motor with BM control, mine communication equipment, wiring cable, new magnetic wire, and a new type of ewf standardized mining locomotive accelerating and breaking resistors. *In charge—E. E. Spencer.*

• **GENERAL EQUIPMENT AND MFG. CO.**

Will have an operating display of automatic block signals, electric track switches and related indicators, controls, and trolley contactors. *In charge—C. R. Marcum.*

• **GOODMAN MANUFACTURING CO.**

Plan to exhibit several new pieces of equipment. Among these are the Type 865B Permissible Tractor Tread Loader with a loading capacity of eight tpm; the 666B Loader; the 2410 Universal Cutting Machine; the 582-42 Permissible Shuttle Car; the L-14 Low Shaker Drive, and several sections of Belt Conveyor. Models or photographs will be shown of the Goodman Type 2600 Miner and the Goodman-McKinlay Miner. A selection of supply parts will also be on display. *In charge—J. D. James.*

• **GOODRICH CO., B. F.**

No description available.

• **GOODYEAR TIRE AND RUBBER CO., INC.**

Plan a booth where convention visitors can come for a rest or to meet. *In charge—Howard O. Wills.*

• **GORMAN-RUPP CO.**

Will present its line of self-priming centrifugal pumps in both active demonstration and formal display. The self-priming feature is to be demonstrated in an open tank unit with an electric motor driven production model pump. In addition, the display will include engine-driven, self-priming "30 Series" pumps on pneumatic mount for use in strip mining drainage applications. *In charge—Gilmore Hiett.*

• **GOULD-NATIONAL BATTERIES, INC.**

Exhibit will consist of a specially designed informative display featuring batteries for the coal mining industry. In addition it will contain specially developed three-dimensional colored slides depicting the extensive research program conducted by Gould.

Gould personnel will be in attendance to discuss the application of batteries. *In charge—Ken Rider.*

• **GULF OIL CORP.**

The Gulf exhibit will feature mining machine lubricants emphasizing the protection such lubricants provide for bearings and gears when servicing is done at the face. *In charge—R. F. Herndon.*

• **GUNDLACH MACHINE CO., T. J.**

Will exhibit a 36-in. two-stage double adjustable coal crusher. In this machine either the top or bottom set of crusher rolls can be adjusted without stopping operation. Cutaway sections of gear boxes and crusher rollers will also be shown. *In charge—T. J. Gundlach.*

• **GUSTIN-BACON MANUFACTURING CO.**

Will be exhibiting their Rolagrip and Gruvagrip pipe couplings and fittings for use with steel or aluminum pipe. Important features of each line will be illustrated in the display. *In charge—M. F. Hauserman, Jr.*

• **HAMILTON RUBBER MANUFACTURING CORP.**

As in years gone by, will feature King Koal conveyor belting in its exhibit. With more than 300,000 ft in actual operation in coal, metal and nonmetallic mineral mining fields, King Koal has become a standard wherever belting is used. *In charge—Hobart H. Todd.*

• **HANNON & SONS, F. R.**

Exhibit will feature two Hanco Electric Screen Heaters, complete with ground-detecting lights and a variable tap changing device. A screen frame will be on display to illustrate the many quick-change attachments available for use on vibrating screens. The frame will be equipped with tensioning rails and copper distribution bars with various types of insulation. *In charge—T. W. Hannon.*

• **HARNISCHFEGER CORP.**

Plan to demonstrate Magnetorque Drive as applied on P&H Power Shovels. Models of the Electric Shovel and Model 1055 Electric Saving Assembly will be shown as will movies of their new P&H Model 1855 Dragline. A diesel engine generator set, their Model WN-200 Sas Welder and a P&H Zip-Lift on show model hoist stand will be on display also. *In charge—Walter Hawkinson.*

• **HELWIG CO.**

Is exhibiting their Multiflex brush with the neoprene pad on top. Also on display is the Transert brush. This brush contains a graphite insert which cannot fall out as it is wedged and force fitted. *In charge—E. A. Steker.*

• **HENDRICK MFG. CO.**

Are bringing an exhibit showing all of the latest types of screens. The flat perforated sheets made both in round and square perforations have been in use for many years. The Flanged Lip Screen popular in the coal fields will be shown in detail, and a new Wedge Slot line will be exhibited. Also on display will be samples of the open steel flooring used in many mining tipples. Nine district managers as well as executives from the home office will be on hand to answer questions or discuss screening problems. *In charge—T. A. Warner.*

• **HENDRIX MANUFACTURING CO., INC.**

Have on exhibit their latest model Stripping Bucket in a popular size featuring their cast 14 percent manganese steel lip, chains and fittings. *In charge—W. G. Hendrix and G. E. Trippe.*

• **HERCULES MOTORS CORP.**

Will display gasoline and diesel engines and power units. Engine sizes will vary from three hp to the large eight-cylinder Vee-type engine of 500-hp, including a six-cylinder engine used in mine locomotives. *In charge—T. S. Klinedimst.*

• **HERCULES POWDER CO.**

Will use a series of panels to depict the use of Hercules permissible dynamites, blasting supplies, and coal stripping explosives. *In charge—George B. Bossert.*

• **HEWITT-ROBINS INCORPORATED**

Will exhibit a single deck Gyrex Screen with Hewitt-Robins Hannon Electrically Heated Screen Cloth Attachment and a full size shuttle conveyor. Samples of screen cloth and a representative group of belt conveyor idlers and rubber products for mining will also be shown. *In charge—R. U. Jackson.*

• **HEYL & PATTERSON, INC.**

Will feature an operating assembly of the standard Heyl & Patterson 8-in. Cyclone Thickener. This assembly, using special plastic tubing and equipment, will illustrate clearly the operation and performance of the Cyclone Thickener. A new Heyl & Patterson water injection system, which greatly improves the efficiency of the Cyclones, will be introduced to the industry and shown in actual operation for the first time.

The Reineveld Centrifugal Coal Dryer, running at slow speed, will be exhibited and an assembly of 14-in. Cyclone Thickeners will also be shown. *In charge—A. G. Gilbert and R. C. Cokeley.*

• **HOLMES & BROS., INC., ROBERT**

Plan to exhibit a Holmes Spiral for lowering coal of all sizes into storage bins or surge hoppers; Verti-Vane Thermal Dryers; car handling equipment, and hoisting equipment including hoists, sheaves, skips, cages and automatic skip and cage loading and dumping devices. Holmes Laboratory Crushers and Pulverizers will also be shown. *In charge—J. G. Walter.*

• **HOUGH CO., FRANK G.**

Will feature the four-wheel drive Models HR & HM Payloader. A rear wheel drive Model HF Payloader will also be on display. *In charge—Raymond P. Wiggers.*

• **HUNSLET ENGINE CO. LTD., THE**

Plan to show a powerful flameproof diesel mine locomotive; 37,000 lb in weight, able to haul 800-ton trains underground and 39 in. high, it has a Cummins flat engine of 170/200 hp for which wide servicing facilities exist. One of the smallest mine locomotives in existence "Tiny Tim," 6000 lb in weight, 1060 lb tractive effort, non-flameproofed, and designed for metalliferous mines will also be exhibited. *In charge—John Alcock.*

• **INSULATION AND WIRES, INC.**

Will display their insulating materials and electric motor maintenance equipment.

• **INTERNATIONAL HARVESTER CO.**

Exhibit will include an International West Coast Model truck with a coal body, an International TD-24 crawler with a Bucyrus-Erie bulldozer and B-170-A scraper, a TD-18A crawler equipped with a Drott Skid-Shovel, and a TD-9 crawler equipped with a Lodover Shovel. Also exhibited will be a cutaway model of an International UD-24 diesel engine. This model will be in operation along with another working model of the Drott Skid-Shovel. *In charge—E. L. Boughton.*

• **INTERSTATE EQUIPMENT DIV., YARA ENGINEERING CORP.**

Exhibit features a 40-cu ft capacity tramcar from one of their conveying type aerial tramways. The car will be mounted to show the method of supporting and propelling tramcars in service. Large photographs will illustrate typical installations. *In charge—Leo J. Vogel.*

• **IRWIN FOUNDRY AND MINE CAR CO.**

Is going to exhibit a miniature 8-wheel mine car; a miniature 8-wheel mantrip car; a roof drill and the safety lock for link and pin-type coupler. The exhibit will also include a belt conveyor, comprising of driving unit, intermediate sections and tail piece; sectional views of an oil filled conveyor roller; a complete installation showing the operation of sequence control switches on belt conveyors; and a rubber-tired electric rotary drill for roof bolting. *In charge—Gray F. Sensenich.*

• **I-T-E CIRCUIT BREAKER CO.**

Plan to demonstrate sectionalizing of underground dc electric power distribution. The application of Automatic-Reclosing Circuit Breakers according to U. S. Bureau of Mines Recommendations is represented on a schematic map of a typical mine system. Visitors to the booth will see the sequence of immediate circuit interruption and automatic reclosing followed in an animated pattern of lights. Maintenance of full production in non-faulted areas is dramatized in the display. *In charge—M. W. Pennybacker.*

• **JEFFREY MANUFACTURING CO.**

Display will include three shuttle cars; a "Colmol" continuous mining machine; roof and horizontal type drilling machines; a crawler loader; a belt conveyor with pneumatic take-up; Aerodyne fans and blowers; a universal coal cutter; double roll crushers, a mechanical vibrating conveyor; electric vibrating feeders; a magnetic separator; and chains and replacement parts. *In charge—J. E. M. Wilson.*

• **JOHNS-MANVILLE SALES CORP.**

Display will show how asbestos helps the coal mining industry. The materials displayed will include corrosion-resistant Transite Pipe, made of asbestos and cement, for mine drainage, water supply lines and exhaust ducts; packings and gaskets for slushers, pumps and similar equipment; asbestos friction materials designed to withstand the increased loads and greater speeds of machinery such as shovels, drag lines, hoists, winches and cranes. Asbestos building material such as Corrugated and Flat Transite used for tipples and fire barriers will also be shown. *In charge—J. R. East.*

• **JONES & LAUGHLIN STEEL CORP.**

No description available.

• **JOY MANUFACTURING CO.**

On display will be three new continuous miners; three new loaders; two shuttle cars; cutter-loader shuttle car team; new mobile coal drill; new rubber-tired roof bolting drill; extensible belt conveyor; new underground auger; telescopic constant-feed stopers; new air leg; compressors; mine fans; bits; new heavy duty conveyor belt idlers; electrical equipment; electrical and mechanical parts.

A new diesel electric shuttle car will operate in an outside area. *In charge—F. H. Nickeson, Jr.*

• **KANAWHA MFG. CO.**

No description available.

• **KENNAMETAL INC.**

Will stress advantages of using long-wearing Kennametal Carbide Bits for all cutting and drilling applications, including many special mining applications and application on many units as standard equipment. Featured tools are cutter bits, drill bits, and roof bits. Simulated, in setting, operation of these tools will be predominant. Tools that will be exhibited include cutter bits, drill bits, roof bits (of both rotary and percussive types), strip bits, augers and pinning rods. *In charge—Edwin H. Johnson.*

• **KENSINGTON STEEL CO.**

Exhibit will feature four groups of "Oro" high manganese steel replacement parts for mining equipment. These include a dragline bucket chain and new design repair links along with shovel treads and teeth. A preparation plant rivetless washbox, refuse chain and renewable tooth sprockets will also be shown. *In charge—H. M. Albers.*

• **KNAPP MILLS, INC.**

No description available.

• **KOEHRING CO.**

Plan to use enlarged and colored photographs to show Koehring equipment in service. *In charge—E. J. Goes.*

• **KOPPERS CO., INC.**

Display will feature the advantages of using pressure-treated wood in the mining industry. The exhibit will point out the benefits from installation of pressure-treated wood, such as low annual cost, minimum yearly maintenance, and guaranteed long life from wood.

• **LEE-NORSE CO.**

Main exhibit will consist of two continuous mining machines. One designed for seams five ft to nine ft high. The second is for use in seams 40 to 60 in. thick. Both use the unique cutting element first presented at the 1951 Coal Show and both are crawler mounted. The third attraction will be a three-wheel jeep operated from a cable reel for supervisor transportation and general utility. *In charge—Edgar R. Phillips.*

• **LE ROI CO.**
Cleveland Rock Drill Division

Will have on display a full complement of Rock Drills for coal mining. Of special interest will be the Le Roi 105-ft tractor and compressor combination "Tractor" with mobildrill attachments for use in strip mines. Blown up views of the Cleveland Rock Drill Continuous Coal Miner will also be on display. *In charge—N. W. Reinker.*

• **LESCHEN & SONS ROPE CO., A.**

Exhibit will be easily spotted by an illuminated revolving reel of "Hercules" (Red-Strand) Wire Rope. On display will be samples of all types and constructions of wire rope used in coal mining operations, including a section of 3-in. dragline rope. Various types of wire rope slings will also be available for close examination. *In charge—Walter C. Richards.*

• **LE TOURNEAU, INC., R. G.**

Will display three major products in its equipment line. They are: an 18-ton capacity rear dump Tournarocker pulled by powerful Model C Roadster Tournapull prime mover; a high-speed, rubber-tired model C Tournatractor with dozer blade powered by 186-hp diesel, with torque converter and packaged, electric shift transmission; and a C Roadster Tournapull with P19 (16 cu yd) Carryall, self-propelled earthmover which strips, hauls and dumps its load. Continuous motion pictures of equipment in action and equipment cutaways are included in the exhibit. *In charge—Stephen Czerwinski.*

• **LEWIS ELECTRICAL MFG. CO.**

Will exhibit a 300 kw 275 v dc Lewis Mine Type Selenium Rectifier as built for Crucible Steel Co. This rectifier was designed to operate continuously under full-load conditions; at 150 percent overload for three hr and under 200 percent overload for 2½ min. *In charge—V. Lubin.*

• **LINCOLN ENGINEERING CO.**

Will exhibit Centromatic and Hydra-Luber automatic centralized lubrication systems for mining machinery. In addition, a new balanced power, automatically controlled pump with special accessories to handle heavy lubricants through a spray head will be displayed. Also a new line of grease guns and lubricant application equipment will be presented. *In charge—Alvin Woodland.*

• **LINK-BELT CO.**

Will highlight the current need for drying fine coal and will have their Multi-Louvre Dryer in operation. A Link-Belt Heavy Media Float-Sink Concentrator will also be featured. A vibrating screen with heated screen cloth; chains and anti-friction bearings, and conveyor idlers will be included in the exhibit. *In charge—L. O. Millard.*

• **LINK-BELT SPEEDER CORP.**

Plans for its principal attraction a fully operating one-in. to one-ft scale model of a two-yd, K-375 shovel-crane, operating with shovel and dragline attachments under simulated stripping and loading conditions. This machine will have a five-ft crane boom (equivalent to a 60-ft boom). As a high lift stripping shovel, the model will employ a 30-in. boom, 25-in. dipper stick, and a 49-cu in. dipper. *In charge—D. W. Lehti.*

• **LONG SUPER MINE CAR CO.**

Exhibit features Piggybacks and chain conveyors as applied to high tonnage Piggyback systems of conveyor mining. Information will also be available on the complete line of Long Chain Conveyors for both underground and above ground service. *In charge—J. B. Long.*

• **LUDLOW-SAYLOR WIRE CO., THE**

Plan to exhibit samples of industrial wire cloth, wire filter cloth, and a variety of square-opening and long-opening woven wire screens. Included are abrasion-resistant square-opening screens woven of inch-thick "Super-Loy" bars, contrasting with gauzes of 40, 60, 80, 100, 200, 300 and 400 parallel wires per lin in., of various corrosion-resistant metals and alloys. Various types of hook strips are to be shown for various types of vibrating screens. *In charge—John F. Steffens.*

• McLANAHAN & STONE CORP.

Plan to have a coal crusher on display. *In charge—J. Craig McLanahan.*

• McNALLY PITTSBURG MFG. CORP.

Is moving its main and divisional offices to the Coal Show. Talk over problems in coal cleaning, drying, centrifuging and general coal preparation with technical personnel. Latest releases on new equipment will be available. *In charge—C. W. Waterman, Jr.*

• MACWHYTE COMPANY

Will feature latest developments in Wire Rope, Braided Wire Rope Slings, and Cable Assemblies for all mining equipment and mining operations.

Wire ropes are now available not only for mine hoists, shovels, draglines, mining machines, etc., but also for special needs, such as machine parts, and for maintenance work with special custom-made slings for safety and easy handling. *In charge—F. P. Holden and V. P. Jenkins.*

• MANU-MINE RESEARCH & DEVELOPMENT CO.

Will highlight their research into stabilization of geologic formations, soil solidification and pressure injection into mass formations. They will also review many of the newer developments and products of the company. *In charge—C. W. Stickler, Jr.*

• MARION POWER SHOVEL CO.

Will have available illustrations, specifications and complete information on each machine built by Marion, including both stripping and loading equipment. The Marion 7400, 10-13-cu yd Walking Dragline; the new Marion 191-M, rated at 10 cu yd as the world's largest shovel on two crawlers; and the Marion 7800, now rated with a 35-cu yd bucket on a 220-ft boom will be featured. *In charge—R. J. Lick.*

• MARTINDALE ELECTRIC CO.

Exhibit will feature commutator and electrical maintenance and repair equipment; electric testing instruments; safety equipment; metal-marking equipment; and portable electric blowers that are convertible to vacuum cleaners. *In charge—Roy E. Blersch.*

• MAYHEW SUPPLY CO., INC.

No description available.

• MECHANIZATION, INC.

Will present the story of coal from the mining face through the preparation plant and into the furnaces of the final consumers. Coupled to this theme will be facts and figures showing their three publications' editorial coverage, penetration of readership and advertising growth. *In charge—Raymond Coombes.*

• MINE SAFETY APPLIANCES CO.

Exhibit will feature the MSA MinePhone, for instant voice communication throughout the mine; the MSA HoistPhone, which allows voice communication between hoisting engineer and cage at all times; the MSA Bolt-Hole Cleaner which collects harmful dusts created by drilling; the Edison R-4 Electric Cap Lamp; the MSA Bantam Rock Duster; and a complete line of safety equipment for mining. *In charge—C. M. Donahue.*

• MINING CONGRESS JOURNAL

Monthly publication of the American Mining Congress invites the foot-weary visitor to "set and rest." The exhibit will feature MCJ's service to the entire mining industry. *In charge—J. C. Fox.*

• MINING MACHINE PARTS, INC.

Exhibit will comprise representative items of the improved replacement parts they manufacture and distribute for underground mechanical mining equipment. Included in the exhibit will be an addition to the well-known family of MMP Square Head Rivet Caterpillar Chains. Typical of the precision parts to be exhibited are alloy gearing, drive shafts, clutch discs, etc., and the MMP-"Jabco" line of Trolley Taps. *In charge—Jay Berry.*

• MINING PROGRESS, INC.

Will feature the "Loebbe-Hobel" and a smaller unit of the German steel conveyor and planer manufactured for continuous mining in seams 26 to 40 in. thick by G. E., Westfalia, Luenen, Germany. The unit has mined 840 tons of cleaned coal per shift in the United States. *In charge—Alfred J. Schneider-Paas.*

• MOBILE DRILLING, INC.

Will present a preview of a new Mobile drill for auger drilling and core drilling, truck, trailer, or skid mounted. Capacity 500-ft of hole in a price range available to most all buyers. This drill carries the unique Mobile drive, a double hydraulic cylinder and many other outstanding mechanical features. *In charge—C. W. Holmes.*

• MORRIS MACHINE WORKS

Will exhibit their Type R Slurry Pump, a heavy, low speed unit especially designed for handling abrasive fluids. The Type R is widely used in coal cleaning plants, handling slurries of all concentrations at low and high heads and under suction lifts as well as positive heads. *In charge—W. M. Mercer.*

• MURPHY DIESEL CO.

Will have a Power Unit and a Generator Set along with cutaway sections of the injector, oil pump, water pump, connecting rod and piston, sectional cutaway of the camshaft housing, cylinder head assembly, and an attractive background exhibit of photographs of engines and generator sets. *In charge—Paul Schnetzky.*

• MYERS-WHALEY CO., INC.

Has announced it will show a newly developed Crawler Mounted Transfer Car for handling ore, rock or coal. It is reported that one feature of the car is its operation by a single 20-hp motor.

• NATIONAL ELECTRIC COIL CO.

Will exhibit windings for mining type electric motors and generators and items of interest in their maintenance. National field engineers, who are specialists in mine problems of motive power and maintenance will be in attendance to explain National standards of quality. *In charge—B. W. Price.*

• NATIONAL MALLEABLE & STEEL CASTINGS CO.

Application of rubber-cushioned draft gears with both Willison automatic couplers and link-and-pin bumpers will highlight this exhibit. An added feature will be a lighter version of the National NC-1 mine car truck for application to large 8-wheel mine cars. Also on exhibit will be the Willison Automatic Coupler, the reduced-size Willison Automatic Coupler, and a ¾-size knuckle-type coupler. *In charge—Herbert H. Smith.*

• NATIONAL MINE SERVICE CO.

Will feature a new 10-ton Diesel locomotive U. S. B. M. approved for underground use. Also prominently displayed will be an electronically controlled automatic charging device for Wheat cap lamps. National's Safe

Cable Rebuilding Service will be demonstrated and a lighter, simpler Koehler Flame Safety lamp will be shown. Tamping plugs will be demonstrated.

At frequent intervals conveyor belt splices will be made for exhibit purposes. Also on display will be a complete line of Bemeco products. *In charge—Gordon MacVean.*

• **NOLAN CO.**

Plan to show three models of Porto Feeder in operation. The display will also include a large scale model of Nolan Gear Driven Rotary Dump, operated by push button by viewers of the exhibit. *In charge—C. G. Hunt and G. W. Merritt.*

• **NORTHWEST ENGINEERING CO.**

Will display photographs of their shovels, cranes and draglines in use in the mining industry. *In charge—G. C. Williams.*

• **OHIO BRASS CO.**

Will have a display of expansion shells and plugs that will be of particular interest to roof bolters. Equipment will demonstrate holding power, torque-tension relationships, importance of hole size, etc. The familiar overhead canopy will be used to show the complete line of O-B Smooth Underrun Trolley and Feeder Materials. Automatic Mine Car Couplers are to be shown. Current collectors and rail bonds will also be given prominent handling in the booth. Other equipment on display will include a complete line of mine motor starters, distribution boxes, fused taps, and ground clamps. *In charge—J. H. Sanford.*

• **OHIO CARBON CO.**

Will exhibit many styles of carbon brushes for rotating equipment as used on mine and mill motors. In addition some samples of mechanical carbons used as water seals on pumps and as bearings in many applications will be on display. Representatives will be on hand. *In charge—F. C. Aurand.*

• **OKONITE CO., HAZARD INSULATED WIRE WORKS DIV.**

Will display a complete range of electrical wires and cables for all types of mining installations. Featured in the exhibit will be the new "Hex-Tite" construction of the Hazacord Twin mining machine cable. Photographs of actual installations will illustrate some of the many uses of Hazard mining cables. *In charge—Thomas R. Weichel.*

• **OLIN INDUSTRIES, INC.**
Explosives Division

Will feature a representative display of dynamites and blasting caps.

Two important features dominate the exhibit. One is a special unit carrying samples of the various types of blasting caps manufactured by Western Cartridge Co. The other unit presents representative samples of dynamites manufactured and distributed by the various Olin explosives operating plants, and the Armstrong Airbreaker, a unique method of mining coal by means of air. *In charge—A. J. Barocca.*

• **OLIVER CORP., THE**

Will display the new OC-18 Tractor which develops 133.0 drawbar horsepower and features air steering. The tractor will be equipped with power control unit and Heil Cable operated Trailbuilder. Another feature of the exhibit will be an Oliver industrial wheel tractor with a Strait-Line Loader. This is a unique overhead loader that permits the operator to back into the load, take the bucket complete overhead and dump into the truck ahead without any turning around or pivoting. *In charge—M. W. Halterman.*

• **OLIVER IRON AND STEEL CORP.**

Will feature the Berry hydraulic pumps, fluid motors and transmissions. Any unit is at once adaptable for use as a pump or a fluid motor, with complete and instantaneous reversibility whether under load or not. In addition, industrial fasteners and pole line hardware will be displayed. *In charge—E. L. Bartsch.*

• **OLIVER UNITED FILTERS, INC.**

Are going to exhibit scale models of the Oliver Horizontal Filter and the American Disc Filter for dewatering coal fines. Also shown will be cutaway models of the Olivite Acid Handling Pump and the ODS Slurry Pump. *In charge—Glen G. Reed.*

• **OSMOSE WOOD PRESERVING CO. OF AMERICA, INC.**

Photos, models, timber specimens and complete technical files on mine roof, wood preservation and the Osmose processes and preservatives will be featured in this exhibit. Descriptive literature and information on wooden mine roof plugs will be available. *In charge—Joseph M. Bray.*

• **PAGE ENGINEERING CO.**

Will feature a replica of the first dragline bucket built by J. W. Page in 1903 compared to a 1953 Page Automatic dragline bucket. Underlying theme of the exhibit will be the progress and contributions made to the industry in the 50 years leading up to Page's Golden Anniversary. Interesting slides will illustrate applications of the buckets and walking draglines. *In charge—C. J. Pollinek.*

• **PARKER APPLIANCE CO., THE**

Exhibit will feature Triple-lok flare and Ferulok flareless tube fittings, and directional control valves for hydraulic systems. A burst chamber will be in operation to demonstrate the leakproof qualities of Triple-lok fittings even at tube-bursting pressures. *In charge—S. E. Voran and Paul Kozak, Jr.*

• **PATTIN MANUFACTURING CO.**

Exhibit will consist of three panels displaying their split type bolt, their expansion shield, a typical roof bolt installation in a mine, and their other various roof bolting products. Part of the display will be animated to show a cross section of a split type bolt spreading over a wedge and the resulting holding effect in the strata. *In charge—Jack B. Dempsey.*

• **PENN MACHINE CO.**

Will feature a display of "Super-Weld" Rail Bonds for use in electrified coal mines. Several types of "Super-Weld" bonds for various installation conditions will be displayed, including the patented "Everlast" "Super-Weld" bond. Also featured will be a few selected items from the varied line of replacement parts which they manufacture for coal mine locomotives, mining machines, loading machines, and continuous mining equipment. *In charge—S. Guy Little.*

• **PENNSYLVANIA CRUSHER CO.**

Will show models and photographs—and further illustrate by literature—its broad line of crushing equipment. This includes Bradford Breakers, Bradford Hammermills, Granulators, Single Roll Crushers, and "One-Way" and "Reversible" Hammermills. Of particular interest will be the Peripheral Feed Bradford Hammermill. *In charge—Robert A. Adams.*

• **PIONEER ENGINEERING WORKS, INC.**

Will exhibit operating models of its vibrating screens and feeders together with conveyor equipment for coal mines and the handling and processing of overburden. *In charge—W. A. Rundquist.*

• **PITTSBURGH SCREW AND BOLT CORP.**

Will exhibit a graphic display of the use of "Pit-Bolts" for mine roof support. "Pit-Bolts" will be displayed in both Expansion Unit and Split Rod Types. Complementing the exhibit will be a series of photographs showing actual installation of the two types of roof bolt assemblies, as well as a "before and after" scene. *In charge—W. J. Francis.*

• **PLASTEX PIPE & EXTRUSION CO., THE**

Will have a complete display of non-corrosive, flexible "Plastex" Pipe and fittings for quick, easy transmission of fresh water, corrosive drainage water, low pressure air or exhaust fumes. Featured will be the new Plastex Yellow Pipe, developed for greater visibility, increased safety and positive identity in darkened mine passages. *In charge—Don T. Linkous.*

• **POST GLOVER ELECTRIC CO.**

Display will include transfer switches, mining machine resistors, resistors for mine locomotives and magnetic contactors for cable reel motors. *In charge—R. W. Haup.*

• **PRECISION CHAIN CO.**

Exhibit will feature sections of Precision cutter chains, both the new standard type for ½ in. x 1-in. bits and the Multiplex type for use with Rockbuster-Multiplex double-end bits. In addition, various cutterbar sections, chain links, bits and bit holders will be shown. *In charge—Frank L. Fulke.*

• **PRODUCTIVE EQUIPMENT CORP.**

Will display a standard open type "Gyroset" Vibrating Screen of suspension mounted type. This screen is a positive eccentric type, two bearing unit. *In charge—L. H. Lehman.*

• **PROTECTOSEAL CO., THE**

Will show Fire Prevention Equipment in the form of Safety Containers, Fittings and Devices for safe-guarding such flammable liquids as gasoline, kerosene, naphtha, alcohol, thinner and others of a similar hazardous nature. *In charge—William E. Belt.*

• **PROX CO., INC., FRANK**

Will exhibit their latest undercutter chains, cutter bars, drive sprockets, throwaway bits and tungsten carbide bits. The background of the exhibit will be a picture of the latest undercutter in large Illinois mine using their equipment. *In charge—Charles J. Forbes.*

• **PURE OIL CO., THE**

Exhibit will feature three separate displays which depict the methods used in producing today's high quality industrial lubricants, a typical gear application, and a continuous flowing oil can.

Available for distribution will be several comprehensive folders particularly pertinent to the lubrication of coal mining machinery. *In charge—Paul Messenger.*

• **QUAKER RUBBER CORP.**
Division of H. K. Porter Co., Inc.

Will feature a miniature coal handling tipple. Sample displays will include all types of conveyor belts, their "Mainliner" Nylon-Cotton, "Loadliner" Rayon and "Ebonite" standard cotton conveyor belts. Also an exhibit will be made of various ingredients that go into the manufacture of synthetic and crude rubber compounds, as well as finished goods of belts, hose, trolley car guards, etc.

• **RAYBESTOS-MANHATTAN, INC.**

Will show an underground mine conveyor in operation with a new type of belt. There will also be an attractive exhibit of industrial rubber products, particularly conveyor belting and hose used in mines. Also to be featured are Homocord, Homoflex, and Ray-Man "F" Conveyor Belts for heavy duty mine service and Ray-Man Tension Master Belt for high lift, super-tension, particularly as a slope belt. Safety Trolley Wire Guard for protecting workers from mine car trolleys will also be featured. *In charge—D. H. Cotrille.*

• **REICH BROS. MANUFACTURING CO.**

Will have on display high speed prospect drills using either air or water for removing cuttings from the hole. Information will be available at booth on high speed rotary blast hole drills for drilling up to 12-in. diam. holes. *In charge—Wendell L. Reich.*

• **RELIANCE ELECTRIC AND ENGINEERING CO.**

Will present precision balancing of rotors for mine motors as highlight of their exhibit. An experienced operator will continuously demonstrate and explain the infinite precautions taken by Reliance to insure long, dependable motor life.

Among the wide variety of a-c and d-c motors being exhibited will be the revolutionary designs which aid the industry to secure increasingly greater tonnages. These include motors incorporating doubled horsepower in the same frame dimensions.

A museum space in the exhibit is dedicated to the now almost extinct mine mule. *In charge—R. L. Custis.*

• **ROBERTS AND SCHAEFER CO.**

Will have a service booth as a place for their many friends to meet, renew acquaintances, rest and discuss problems with company representatives in comfort. Descriptive literature of their equipment will be available and a photographic display will highlight various preparation plants they have designed and constructed during recent years. *In charge—E. C. Carris.*

• **ROEBLING'S SONS CORP., JOHN A.**

Will display a comprehensive range of wire rope constructions, wire rope slings and electrical wire and cable for mining applications. *In charge—W. K. Hanna.*

• **ROME CABLE CORP.**

Will feature Rome 60 mining cables designed for the powering of portable mechanized mine equipment as well as fixed installations. Samples will be displayed showing a unique inner construction of cables for shuttle car use. Literature will be available for distribution. *In charge—D. H. Thayer.*

• **RUGER EQUIPMENT, INC.**

Will present for the first time their newest development, the hand-powered hydraulic Timberlift, which has completed a series of highly successful mine tests. The Timberlift requires no special motors or motor-driven air equipment. *In charge—Paul L. Jarvis.*

• **RUST-OLEUM CORP.**

Will feature their line of Rust Preventive Coatings. Company representative will be on hand to discuss problems in rust control and demonstrate the use of their product.

• **RYDIN RAILWAY EQUIPMENT CO.**

No description available.

• **SAFETY FIRST SUPPLY CO.**

Exhibit will center about the Hard Boiled Miner's Cap which is made of fiberglas. Displayed for the first time at any exhibit, the Fiberglas Caps will be mounted complete with miner's lamps on the models. Other products to be featured are the Scott Air-Pak, a self-contained breathing apparatus; and the E & J Resuscitator, Inhalator and Aspirator which automatically breathes for the patient. *In charge—Phillip A. Lascher.*

• **SALEM TOOL CO.**

Plan to show a McCarthy Heavy Duty Highwall Auger, a Vertical Auger Shot Hole Drill and McCarthy Coal Recovery Drills. All of these will be new models. They hope to exhibit both open-pit and deep mine Coal Recovery Drills. *In charge—V. J. McCarthy.*

• **SANFORD-DAY IRON WORKS, INC.**

Expect to exhibit a 10-ton Automatic Drop-Bottom Mine Car with sealed doors and overlapping car ends, spring-mounted, outside bearing trucks and automatic couplers. *In charge—George E. Jones.*

• **SCHROEDER BROS.**

No description available.

• **SHELL OIL CO.**

Display will point up how Shell research has developed products for the industry. A technical staff will be on hand to explain application of specialized mining products on display and information will be available on the full line of Shell Industrial Lubricants. *In charge—Al Valter.*

• **SIMPLEX WIRE & CABLE CO.**

Booth will feature a display of their "geared-type" Shuttle Car and Mining Machine Cables. On display will also be a number of other different kinds of cable, all of them for use in mining service. *In charge—E. J. MacKenzie.*

• **SIMPLICITY ENGINEERING CO.**

Will show their two different types of screens. Both the Single Deck Horizontal Simplicity Coal D'Watering Screen and the Double Deck Simplicity Simpli-Flo inclined-type two bearing screen will be in operation. *In charge—J. C. Powlison.*

• **SKF INDUSTRIES, INC.**

Will display their complete line of anti-friction bearings and pillow blocks. Highlight of the exhibit will be the SY Pillow Block. *In charge—E. H. Wagner.*

• **SOCONY-VACUUM OIL CO.**

Will portray the importance of Planned Lubrication and stress the many factors involved. The exhibit has been designed to point up the value of Socony-Vacuum's 4-step Program of achieving efficient Preventive Maintenance of mining equipment. *In charge—C. J. Copley.*

• **SOLVAY PROCESS DIVISION**
Allied Chemical & Dye Corp.

Will highlight their display by a slide presentation on the use of calcium chloride to freeze and dustproof coal shipments and coal hopper cars. In adition, Solvay will also have on display samples of flake calcium chloride and literature on the use of calcium chloride for freeze-proofing and dustproofing coal. *In charge—Jos. Manion.*

• **STAMLER CO., W. R.**

Exhibit will consist of a Stamler Hydraulic Car Spotter mounted in a section of track to show actual installation inside of mine. Car spotter will be equipped with adjustable safety dogs, automatic dog release, self-raising moving dollys and other features. *In charge—L. W. Miller.*

• **STANDARD OIL CO. (INDIANA)**

Exhibit will be of an institutional nature and will describe their facilities to serve the coal industry. Research facilities, technical services, trained lubrication specialists, refinery and supply facilities will be effectively highlighted by an animated technique. Trained lubrication engineers will be available to discuss lubrication problems. There will be adequate seating, and visitors to the show are invited to avail themselves of the facilities. *In charge—V. T. Miners and M. F. Miller.*

• **STANDARD OIL CO. OF OHIO**

Display will relate particularly to oils and greases that are used for mining operations and sales representatives as well as engineers will be in the booth in order to answer engineering problems.

• **STAR JACK CO.**

Will feature several new products besides its standard line of industrial hydraulic jacks and aluminum screw type Mine Roof Safety Posts.

• **STEARNS MAGNETIC, INC.**

Will display rectangular suspension magnet and a permanent magnetic pulley. Both will be in operation. *In charge—William E. Barta.*

• **SUPERIOR CARBON PRODUCTS, INC.**

No description available.

• **SYNTRON CO.**

Will exhibit vibrating grizzlies, vibrating screens, vibrating picking tables, bin vibrators, portable power tools, test sieve shakers, electric heating elements and mechanical shaft seals for pumps. This year, Syntron will also show two of their newer products, first a power conversion unit, made up with their own selenium rectifier stacks, for converting high voltage a-c to d-c power—second, a new line of long shaker conveyors. Representatives will be in attendance to explain the application and operation of the various types of equipment. *In charge—D. C. Black.*

• **TALCOTT, INC., W. O. & M. W.**

Will have on exhibit a complete line of Belt Fasteners for leather, woven, fabric, transmission and conveyor belts. Featured will be the Talcott Conveyor Belt Fasteners and the Talcott Acme Patch Fasteners. *In charge—M. W. Talcott and G. Crowther.*

• **TAMPING BAG CO., THE**

Will feature their "Seal-Tite" Wet-Strength Tamping Bags, made from specially treated Kraft paper, with water-proof adhesives. They will also exhibit their complete line of Brush and Weed Control chemicals, for use in right-of-way spraying, and general weed control. *In charge—Alfred E. Pickard (Red Necktie).*

• **TEMPLETON, KENLY & CO.**

Will exhibit a complete range of models of Simplex Mechanical and Hydraulic Jacks, and Pullers. *In charge—N. L. Montgomery.*

• **TEXAS CO., THE**

Features Texaco Industrial Lubricants and its engineering service. Exhibit background includes not only samples of Texaco Lubricants used in coal mining but also transparencies showing coal mining equipment where Texaco job engineered lubricants have been used.

• **TIDE WATER ASSOCIATED OIL CO.**

Will incorporate color, lighting, animation, literature and murals to tie-in and depict their brand name and engineering service. *In charge—N. R. Hostler.*

• **TIMKEN ROLLER BEARING CO., THE**

Exhibit will consist of a built-up display showing 19 different types of Timken bearings. In addition to this central mechanized unit, they will also show the Timken bearings and parts which are regularly used in mine cars and mining equipment of all kinds. *In charge—E. C. Reither.*

• **TOLEDO PORCELAIN ENAMEL PRODUCTS CO.**

Will show a small structure built with V-Corr roofing, siding and flashing showing the method of fastening. Full width siding sheets will serve as a backdrop. *In charge—H. P. Seymour.*

• **TOOL STEEL GEAR & PINION CO., THE**

Exhibit will feature coal mining machine parts as manufactured by them. Also exhibited will be cutaway samples illustrating full depth of the special Tool Steel hardened wearing surfaces and the heat treated refined core for maximum strength. Many translites will illustrate additional coal mining products and Tool Steel manufacturing facilities. *In charge—C. R. Burrell.*

• **TRABON ENGINEERING CORP.**

Will show fully automatic lubrication systems for loaders, shuttle cars and continuous mining machines using the Trabon "Hydra-Lube" hydraulically powered pumping unit and type "M" manifold lubricant distributors. Also, electrically and mechanically operated lubrication systems for crushers, screens, conveyors and other processing equipment will be displayed. Typical systems for some machines will be operating including the "Hydra-Lube" pumping unit and a transparent plastic working model of the type "M" manifold lubricant distributing valve.

• **TRACY CO., BERTRAND P.**

Will show complete line of cutter chains, gears, pinions and representative repair parts for coal mining machinery. *In charge—D. M. Hildebrand.*

• **TRIANGLE CONDUIT AND CABLE CO.**

Will exhibit four different types of Plastic Pipe. Photos showing the use and various types of installations will also be included. A sample of pipe showing its flow characteristics will be included in the presentation. *In charge—J. E. Winick and Ed Adams.*

• **TWIN DISC CLUTCH CO.**

Will display part of their line of industrial clutches both manually and power-operated up to 1350-hp capacity; hydraulic coupling drives from one to 700-hp; and torque converters up to 1000-hp sizes. *In charge—G. W. Upp.*

• **TYLER CO., THE W. S.**

Will feature a Ty-Rock (Vibrating) Screen of new design. A Ro-Tap Testing Sieve Shaker and Tyler Standard Screen Scale Testing Sieves along with a large selection of woven wire screens will be shown. *In charge—H. F. Lawrence.*

• **UNION WIRE ROPE CORP.**

In an entirely new exhibit samples of "Tuffy" Wire Rope Products will be shown. These include: dragline and scraper ropes, slings, dozer, choker and mining machine ropes. Literature covering the entire line will be available. *In charge—R. B. Boand.*

• **UNITED ENGINEERS & CONSTRUCTORS, INC.**

See Fairmont Machinery Co.

• **U. S. BUREAU OF MINES**

Will use color transparencies and color photographs to depict virtually all Bureau activities under coal-mine safety and coal research. The exhibit will show mine rescue teams in action, first aid or accident prevention training, roof bolting, and mine equipment testing. Laboratory experiments in coal carbonization will be featured, also research in the Bureau's explosives testing gallery at Bruceton, Pa., and in the Synthetic Liquid Fuels Demonstration Plant at Louisiana, Mo. Mounted on a second, smaller panel will be samples of roof bolts produced by leading manufacturers.

• **U. S. RUBBER CO.**

Electrical Wire & Cable Dept.
Mechanical Goods Div.

Exhibit will feature their Electrical Insulated Wires and Cables with particular stress on heavy mining machine cables for 600 v and over 600 v use and shielded types as well. A flexing and twisting machine will show how U. S. Royal portable cords and cables are tested daily at the factory. A modern conveyor belt vulcanizer which will demonstrate the splicing and repairing service that is available on their conveyor belts. A complete line of industrial products will also be displayed. *In charge— R. H. Turner.*

• **U. S. STEEL CORP.**

American Steel & Wire Division
Tennessee Coal & Iron Division
National Tube Division
U. S. Steel Supply Division
U. S. Steel Export Co.

Will display several products of interest to coal people, among them a section of used stainless steel coal chute, alloy and high strength steel for operating equipment, wire rope and electrical cable. *In charge—John McGrath.*

• **UPSON-WALTON CO.**

No description available.

• **VAN CLEEF BROS., INC.**

Will display their full line of electrical accessories. The well-known "Dutch Girl" will be present in the booth. *In charge—C. G. Geiger.*

• **VAREL MANUFACTURING CO.**

Indoor and outdoor exhibits will feature Varel drilling machinery. These rotary rigs, for vertical holes in strip mines and quarries, use the air blast principle of drilling. Varel Quarry Bits will also be displayed. *In charge—Daniel W. Varel.*

• **VASCOLOY-RAMET CORP.**

Will have its complete line of mining tools on display for inspection. They also will demonstrate by means of a new tool fixture and on actual grinding set-up the proper means of grinding roof drills to save on grinding time and wheel costs, and to give longer tool life. *In charge—R. O. Moore.*

• **VICTAULIC CO. OF AMERICA**

Will display Victaulic Pipe Couplings ranging from ¾-in. through 60-in. pipe sizes, its complete and varied line of modern Full-Flow Elbows, Tees, Reducers, Fittings and Plug Valves, Vic-Groover Pipe Tools in sizes ¾-in. through 6-in., and Roust-A-Bout Pipe Couplings for plain end pipe applications. Several new developments will be demonstrated including the boltless Snap-Joint Coupling

and the plastic insert for use in jointing flexible plastic pipe.

Operating units carrying air pressure will demonstrate the Victaulic Method of Piping for all mine and mill pipe systems. *In charge—R. W. English and Frank Costanzo.*

• **WATER NEUTRALIZING CO.**

Will have on display an operating patented machine used for introducing a nutralizing agent into the water supply. For use in the coal industry, it is particularly applicable to "make-up" water in washing plants where the source of supply has become acidic. *In charge—Henry O. Erb.*

• **WATT CAR & WHEEL CO.**

Will have easy chairs to aid in resting tired feet. Company representatives will be on hand to discuss mining problems and answer questions.

• **WEDGE BAR SCREEN CORP.**

No description available.

• **WEDGE WIRE CORP.**

Will show Wedge Wire Screens in different materials and openings. Also the methods of installations on vibrators, shakers, and other types of equipment. Featuring Wedge Wire in arc wire, a screen constructed with curved wire. This is a new addition to the present line for specific problems. *In charge—W. E. Bixby.*

• **WELLMAN CO., THE S. K.**

Exhibit will feature all-metal Velvetouch clutch plates, facings and brake linings for heavy duty mining equipment. Included will be friction parts for tractors, trucks and off-highway strip mining units, as well as parts for deep-mining equipment. Velvetouch Matched Facing sets for extra heavy duty will also be shown. *In charge—T. A. Novotney.*

• **WESTERN MACHINERY CO.**

Exhibit will center about "Wemco's" Drum Separator for Heavy Media and a "Wemco" Fagergren Flotation Machine. Other items to be displayed include an operating model of a Heavy Media Separation plant, with a plastic drum seperator and solid pump with a plastic case to show principles of operation. *In charge—R. W. Hernlund.*

• **WESTINGHOUSE ELECTRIC CORP.**

Will feature a new type of "talking" exhibit, which will not only show the latest type of electrical equipment for coal mining but cover the advantages of the equipment to operators in terms of increased production and lowered maintenance. Among the items which will be featured will be a new type Ignitron Power Conversion Center, Mine Type Sectionalizer, Selenium Rectifier for small blocks of DC Power, Mine Locomotives and the complete line of motors and control for underground, cleaning plant and open-pit operations. *In charge—R. L. Killibrew.*

• **WEST VIRGINIA ARMATURE CO.**

Plan to display a representative selection of their armature and field coils from their complete line of electrical and mechanical replacement parts for coal mine equipment. Axle linings, journal linings, journal boxes, bearing houses, etc. will be shown also. They will demonstrate how their coils are made. *In charge—C. H. Brunner.*

• **WEST VIRGINIA STEEL AND MANUFACTURING CO.**

Will exhibit their line of mine frogs and switches and steel mine ties. Also shown will be samples of switch stands, and a complete line of roof bolting equipment. *In charge—J. B. Haskell.*

• **WILMOT ENGINEERING CO.**

Will exhibit an operating model of Keystone riveteless chain conveyors. However, there will be in attendance engineers able to discuss the firm's coal and mineral cleaning equipment. All types of parts will be shown on the moving model or in the display. The latter will include samples of all specified sizes of chain, furnished in drop-forged steel, alloy or cast chrome manganese. A selection from their featured line of chain attachments will also be displayed. *In charge—H. R. Middleton.*

• **WINTER WEISS CO., THE**

The Portadrill display will include truck-mounted single unit rotary drilling equipment for vertical blast holes in removal of overburden, in actual pit and quarry operations and in strata exploration and identification.

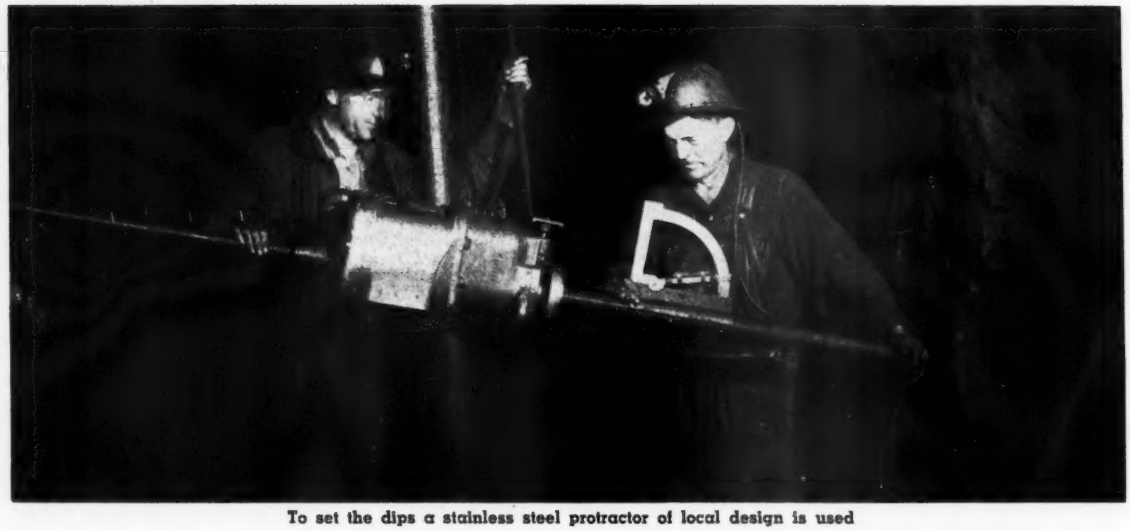
Featured equipment is the "air-blast" model utilizing compressed air as the cutting removal force. Standard rock bits or finger type drag bits are used in all normal operations. *In charge—O. D. Colquitt.*

• **WOODWELL CO., JOSEPH**

Exhibit will feature "Ruflok" used to seal mine roof and ribs to prevent spalling of rock, slate and coal; to seal concrete block stoppings and overcasts and to seal temporary brattice cloth stoppings. Photographs will be used to show field applications of Ruflok.

• **YARDLEY PLASTICS CO.**

Will feature plastic pipe for use in and about mines. *In charge—Robert Rosel.*



To set the dips a stainless steel protractor of local design is used

Blast Hole Drilling at the Tennessee Copper Company

Better Over-all Costs and Safety Indicate Definite Place In Deep Hole Drilling Program For Tungsten Carbide Insert Bits

By EZELL FLOURNOY
Assistant Chief Mining Engineer
Tennessee Copper Co.

BLAST hole stoping has been practiced in the mines of the Tennessee Copper Co. for several years and has proven an efficient, safe, and economical stoping method.

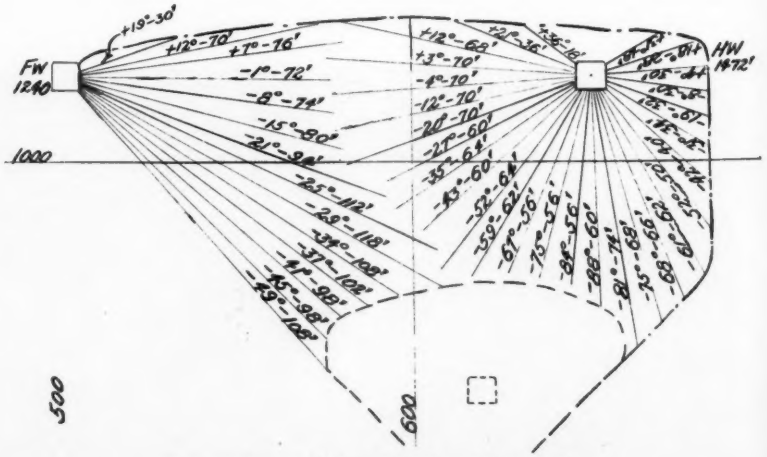
Before going into the discussion of the recent carbide insert bit experiments it would probably be best to bring up to date our blast hole stope drilling practice using the diamond drill.

Introduction of ring drilling, or diamond drill blast hole stoping, was primarily a safety measure to protect the miner in the sub-level underhand stopes, where the mining bench had a tendency to slough off or fall away. Secondly, the economic factors involved were the estimated greater productivity per driller and the minimizing of coarse muck from sloughing. This sloughing was confined primarily to the Boyd mine, a massive sulphide orebody crossed by numerous joint floors or seams.

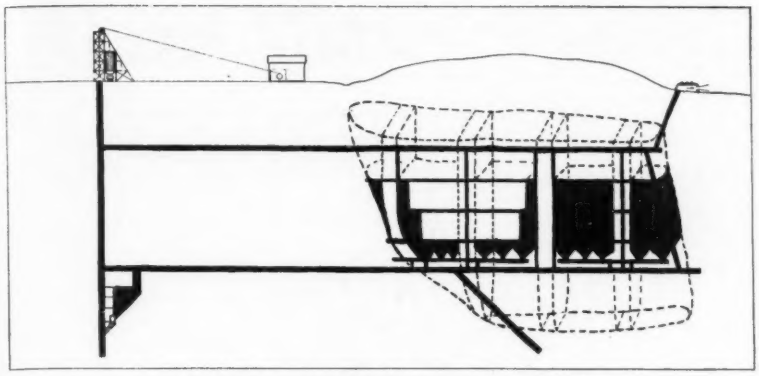
Typical Stoping Layout

Blast hole stoping (Noranda type) is used extensively in the Boyd mine. The Boyd orebody varies in width up to 300 ft. Originally the pillar system for sub-level underhand stoping was laid out for 70-ft stopes and 40-ft pillars, but due to exceptionally strong foot and hanging walls it has been found that stopes 180 ft along strike between pillars will stand.

In typical blast hole stoping as practiced at the Boyd mine, a more or less conventional system of development of the various scram drifts and raises, sub-levels and slot crosscuts is used. Experience has shown that a burden of four ft between slice rounds was the most economical, with a burden at the points of the holes of between 7 and 10 ft. The actual slice



Slice rounds are designed by the mining engineer

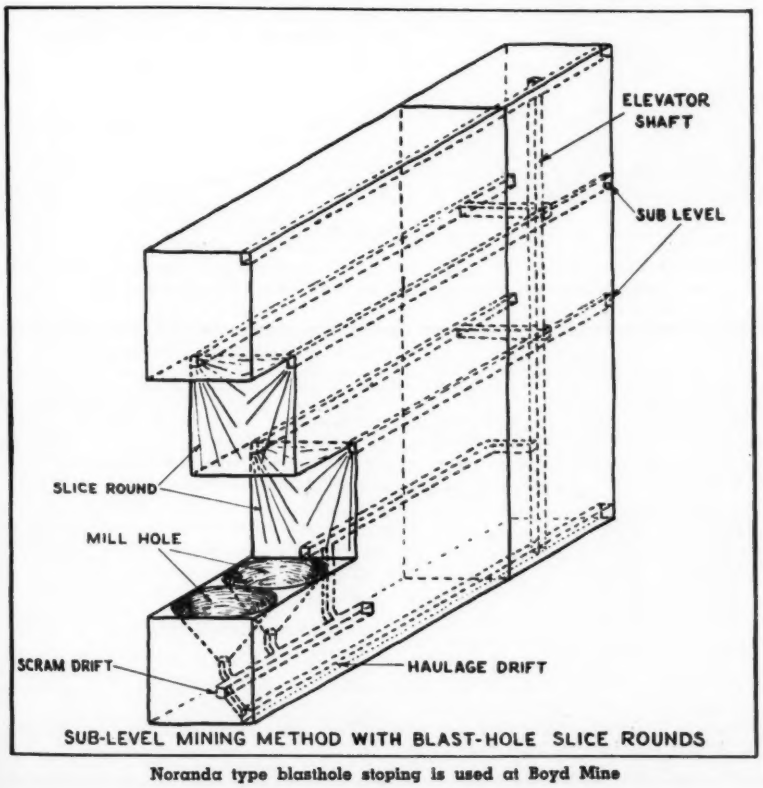


Typical layout at Boyd Mine, Tennessee Copper Co.

round produces approximately 18,000 tons of ore at 2.5 tons per ft of hole drilled.

Drilling is done with Joy HS-15 machines, with 24-in. feeds, rotating up to 5000 rpm. This permits cutting rates up to 2.5 fpm. The two-ft "E" rods with adapters permit rod changing ahead of the machine. Standard EX concave plug pits are used and set with about 8.8 carats of highest quality bortz. The center of the bit is set with stones at 15 per carat; the kickers and outside stones are 25 per carat and the face is set with 40 per carat stones. The footage per bit averages 183, with 75 percent diamond salvage. An average of 135 ft of hole is drilled per man shift. The "Buddy" system is used with one man operating a machine and two or more machines to the stope. Slice rounds are designed by the mining engineer. Location and direction of the slices are painted on the ribs of the stope drift. Each driller is given a slice round drill pattern showing the dip and length of the hole. To set the dips of the holes a stainless steel protractor of local design is used. For blasting, 1¼-in. by 12-in. high velocity dynamite is used. The loading of about 80 percent of the total hole footage drilled is done according to a loading chart corresponding to the slice round drill pattern.

Blasting is done electrically, using one electric blasting cap in each drift attached to primacord arranged to each hole. In long holes the primacord is placed in the hole to a depth so that not more than 30 ft of dynamite is beyond the primacord. This insures proper propagation of the dynamite. The blasting of a single slice is normal, with occasional part slice blasts to minimize concussion. Double row blasting is seldom done. The drilling of a number of slice rounds ahead of the blasting is not practiced except in unusually strong ground with no floors. This minimizes the loss of drilled holes due to ground movement from blasting of the front slice rounds.



Noranda type blasthole stoping is used at Boyd Mine

Study Dynamite Use

Drilling and blasting of a complete slice round produces about 325 tons of ore per manshift. In the primary breaking, about 0.189 lb dynamite is used per ton of ore broken. The secondary breaking, in the slusher drifts, consumes about 0.159 lb dynamite per ton of ore trammed. Since the dynamite consumption in the secondary break is nearly as large as the dynamite consumption of the primary break, one looks for the reason. A study showed that the large blocky muck of the primary blasting resulted from uneven dynamite distribution, sloughing of ore from undercut backs, joints or seams, permitting back break and tough ore improperly burdened for shattering.

To remedy all of the above causes is impossible, but carrying successive lifts as close as possible minimizes sloughing from the undercut backs. From various tests it was concluded that the present hole spacing and burden were the most economical, therefore to get better fragmentation more dynamite is needed in parts of the holes. As a result of this analysis experimental deep hole test drilling was started in the Boyd Mine, using 2⅛-in. carbide insert bits for the purpose of obtaining a larger hole; also to find out the economics and details of the work. If large hole drilling proves economical it will probably be necessary to check against the cost of drilling larger holes with the diamond drill.

Drill Bigger Holes

Deep hole drilling equipment consists mainly of a four-in. percussion drifter; one-in. hex., three-ft change, alloy steel rods; 1¼-in. round lugged, 12-in. over-all, ring sealed shanks; 1¾-in. diam rod couplings, and rod to bit adapters.

The drilling operation brought to light several important facts, namely; the drilling efficiency dropped considerably when holes were drilled over 60 ft deep. The carbide bits should be changed after drilling about 60 ft in order not to flatten the carbide in-

sert cutting faces too much, thus prolonging the bit life by increasing the number of regrind usages. The blowing and washing equipment of the four-in. drifter will not clean the heavy sludge from the down holes. Auxiliary washing equipment is needed. The four-in. drifter in this service does not perform well on 75 psi air pressure or less and it is necessary to have 120 psi water pressure at the machine in order to flush the sludge out of the holes. After completing several thousand feet of drilling the following table lists various data which are self explanatory.

It is seen from the cost data table that the drilling cost per ft for the diamond drill is less than that for the percussion deep hole machine. The diamond drill is better adapted to drill faster on holes 50 to 100 ft deep and is more advantageous to one-man operation. On the other hand, the deep hole machine, while drilling more slowly and requiring two-man operation, does drill a larger hole. This larger hole means that more explosives can be loaded, insuring better fragmentation and allowing a larger burden between slice rounds, therefore a lower cost per ton of ore broken is obtained.

Lower Costs Expected

Based on data obtained from the test work the slice round diagrams and calculations, illustrated, were made.

Fig. 1 shows a standard diamond drill slice round with the present level interval and drift spacing. It will be noted that the tons per ft of hole drilled is 2.23 and the pounds of explosives per ton is 0.21 with a four-ft burden between slice rounds. Since the larger hole pattern would not be economical if drilled on the same pattern and burden as the EX holes, a new slice round design was necessary. In Fig. 2 is shown a proposed slice

(*Continued on page 111*)

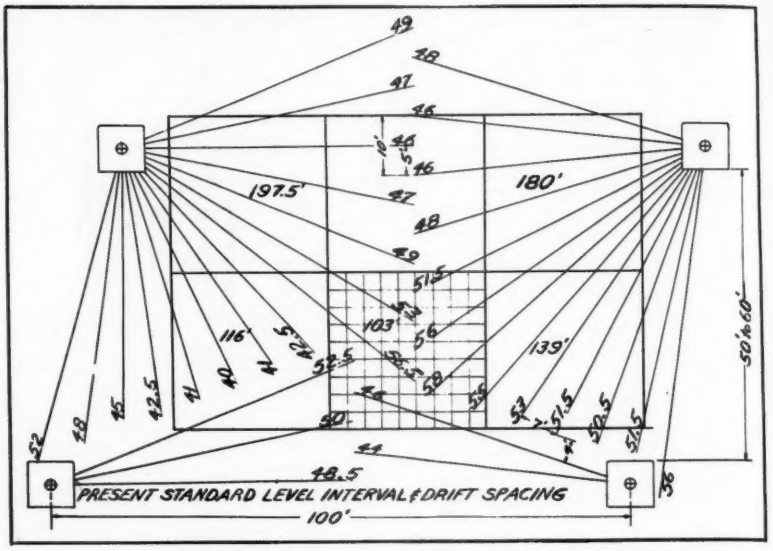


Fig. 1 Standard diamond drill slice round with present level interval and drift spacing

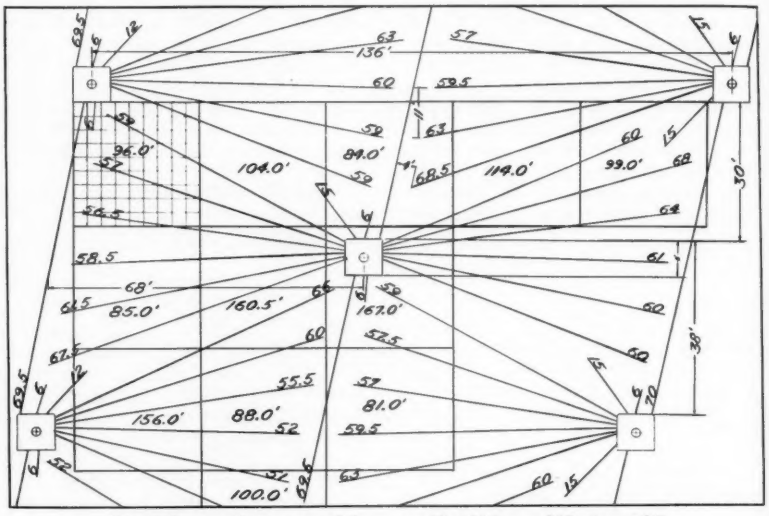


Fig. 2 Proposed slice round for use with 2⅛-in. carbide insert bit

COST DATA

Item	Carbide Insert Bits & Alloy Steel Rods: No. Used	Unit Cost	Item Cost	Feet Drilled	Regrind Per Bit	Ave. Bit Footage Per Use	Cost Per Foot	Diamond Drill Bit Performance: Feet Drilled	Cost Per Foot
Labor			$435.68	1923			$0.2265	19.935	$0.165
Bits	10	$19.28		331.5*	4	66.3	0.0582		0.180
Grinding Cost			7.69	1923			0.004		
Alloy Steel Rods	30	11.45	343.50	2800*			0.1228		0.028
Rod Couplers	30	4.65	139.50	2500*			0.0558		0.008
Shanks	1	10.65	10.65	1234			0.0088		
Shank Seals	14	0.15	2.10	1923			0.0011		
Water Tubes	3	3.05	9.15	2800*			0.0033		
Bit Adapter	1	7.85	7.85	1074			0.0073	Core Barrels	0.005
Sludge Removal Labor for 1½ Days			43.63	1923			0.0227		
Total							$0.5105		$0.386

* Indicates Estimated Figures

Note: The cost figures are based on 19 days' work in which time 1923 ft of hole were drilled. For comparison with the diamond drill performance in the same stope the figures for the year 1951 were used.

Hard Money Versus Inflation

Now Is The Time to Do Something Constructive About Convertibility

By HON. FRANCIS CASE
U. S. Senator from South Dakota

I AM not an economist. I am not a banker. I am not a miner. I am not an engineer. But I grew up in a land that is still the land of the prospector and miner—the Black Hills of South Dakota. Here is the home of the Homestake gold mine. The center of an important feldspar industry, producer of lime, bentonite and cement. The state is currently the locale of a booming search for such radioactive ores as carnotite and autunite, and my home town of Custer is the site of one of the buying stations for mica. We have as well the prospect for a substantial output of strategic beryl and lithium.

I admire what it took to give us the country we have. And, I plead guilty to prejudice for the cause of the West. Without the self-reliance, the resourcefulness that the opening of the frontier and the development of the West have given to the American character, our country would not have become what it is. I only wish that some of the peripatetic peddlers of American substance abroad today had more of the salty ideas of possession and property held by the old-time prospector.

But pleading guilty of a love for and pride in the West and what it produces must not lessen our sense of responsibility to set before the nation the worth and the value of our products. I refer now directly and specifically to the contribution which hard money can make to combatting the inflation that exists.

I shall not assert that restoration of the gold standard with free convertibility will totally control inflation. I do assert, however, that gold can police inflation. I assert, further, that the proper use of gold can give protection to the toil and the sweat of the working men and women of the world.

We Do Have Inflation

Some people may deny the presence of inflation, today. In China in 1948, the exchange rate was 8 million to 1. We do not have that kind of inflation in the United States now.

But within the past year, I heard a Senator presenting the military appropriation bill say that the rise in the cost of a certain airplane had cost the country more planes in dollars since the start of the Korean war than had the action of the enemy on the battlefield.

And last spring, when Thos. H. MacDonald, Commissioner of Public Roads, was presenting testimony to the Public Works committee of which I am a member, he said that in 1951, the dollar got 43 cents worth of construction in terms of 1939.

And if you go shopping today, you can find shoes at $22 that you could have bought for $12 a few years ago and overalls for $4.50 that were $1.50 within memory.

And is there anyone who has not winced a bit when he discovered that the $100 he got or could get for a maturing war bond would not buy today what the $75 the bond cost would have bought him 10 years ago? Frany Pick, publisher of Pick's World Currency Report, has called such bonds "confiscation certificates," pointing out that those who bought bonds 11 years ago have lost 47 percent in purchasing power.

So, from shoes to ships and from bonds to highways, the presence of inflation speaks up. An economist might put it in terms of graphs and curves, but however the facts may be presented, inflation means a dollar won't buy what it used to buy in almost every field. The exceptions are in those items where improved methods of production have off-set the increased volume of money which has been put into circulation for the production of non-consumer goods and the financing of a growing public debt.

Brakes Removed in 1934

The absence of the full gold standard, however, in my opinion, did not produce the inflation; it only removed what might have been a helpful brake, had convertibility been maintained at the time the price of gold was changed, back in 1934.

Inflation can be described as lots of dollars and little goods. The goods should be limited to consumer goods. Right now we are turning out of plants and factories a large tonnage of goods. But much of it is war goods produced with high dollar wages. The wage-earner making tanks does not buy tanks or airplanes—he wants better clothes or more beefsteak or a new television set. The volume of purchasing power turned loose by building war materiel competes for the consumer goods produced by the portion of the population not engaged in war industries.

But this is not the only cause of inflation, although it may be the greatest. Once government financiers find how easy it is to pay bills by printing dollars instead of producing them, financiers become politicians. They play Santa Claus. They foster, wittingly or not, the idea that government is something to live off of, instead of under. The party recently in power boasted what it had given to the people and soft peddled what it took from them or will take from their children. It becomes easy to forget that government cannot give anything to anybody it does not take from somebody.

Precisely here is where hard money would protect the people. The point was neatly made in a panel discussion by Congressman Howard Buffet of Nebraska, sometime ago. He said:

"A currency redeemable in gold on demand seems to be the right on which all our freedoms ultimately rest. It enables the people silently, but effectively, to protect the fruits of their labor."

That is, if they can turn some of their savings into gold, they still have

the gold, and whatever comes, gold will still talk—if they can have it legally.

Dr. E. C. Harwood, director of the American Institute for Economic Research, has estimated that life insurance reserves, social security trust funds, individual holdings of government bonds and savings accounts total $230 billion. That is his estimate of so-called liquid savings or resources of the people. If the purchasing power of that can be stolen or reduced in the order of the 43-cent road dollar, you can quickly see why thrifty Frenchmen hoard gold. For gold is gold in France or Siam, in Bombay or London; in the days of Julius Caesar or Adolph Hitler, in 1776 or 1849; in South Africa or the Klondike.

Now you will note I did not say in the days of the New Deal and the Fair Deal. I might have but you would not have understood me. Even in those days, however, tribute was paid to the power of gold as in hardly any other epoch. FDR thought so much of gold that troops entering German cities looked for Hitler's hidden gold as soon as they got inside the gates. The previous administrations thought so much of gold that they refused to let ordinary citizens have any. They locked it all up in a vault at Fort Knox to create a huge "international buffer stock" to honor the accounts of other nations and the citizens of other nations, denying it only to our own citizens.

Some people seem to think that the idea of an "international buffer stock of minerals" is without precedent; they were mistaken. Paley and associates could have gotten their idea from the gold at Fort Knox, but let me say to their credit that, at least as I understand their proposal, they do not propose to deny individual citizens the right to own, to buy and to employ the minerals they would stockpile, nor to restrict such rights to citizens of other countries.

Face the Facts

To a layman like myself, it would appear that our government has been stubbornly refusing to look at the facts of life in respect to gold.

You will recall that the London Economic Conference broke down in 1933 when the President sent instructions to our representative to withdraw and not to engage in any commitments for adjusting exchange rates on the basis of gold. Our gold stocks steadily drained away, until finally slowed down by purchases above the legal rate and finally halted by an absolute embargo. And the gold miners of this country prior to the actual increase in the price of gold were forced to sell gold to the Treasury at a price below the world price. We are again at that stage where gold miners cannot sell their gold on the world market.

There was a lot of nonsense fed the mining industry and the public along in 1935 and 1936 about the gift to gold miners when the legal price was increased from $20.67 to $35 per ounce—but the cold facts are that gold was selling on the markets of the world for far above $20.67 for many months before the change in the U. S.—and for months producers in the United States were forced to take less than the world price. They were not permitted to ship it abroad.

The hard-rock producers are in the same position today—forced to sell their new gold only to the government and that at a price substantially below what it has been bringing on the open markets of the world for many months. The world market is reserved, by our unilateral action for the producers of the exchange-short countries whose budgets we balance with gifts and for the gold turned out by the Kremlin's slave-miners in the U. S. S. R.

Other Devices Futile

We have tried a lot of devices in place of gold. You recall Dumbarton Oaks and Breton Woods, the International Monetary Fund, the International Bank, the Marshall Plan, the Mutual Assistance Pact, the European Payments Union, etc. We are not out of the woods yet, but we have been getting some interesting suggestions, and perhaps learning some lessons.

In September, 1951, the International Monetary Fund gave up a four-year struggle against the premium price being paid for gold in the open markets outside the United States. In 1947, the Fund had urged member countries to take "effective action" to suppress transactions at premium prices. But, "that the Fund was fighting a losing battle soon became apparent," said the National City Bank of New York in its monthly letter for August, 1952. "Despite Fund objections more and more gold flowed into the premium markets, attracted by high prices which in turn reflected the searching of people for a reliable store of value."

The bank's letter notes that by 1949, South Africa was disposing of 40 percent of its gold output in "fabricated art objects"—such as ash trays and paper weights—and that by 1951, over 80 percent of the total world gold output outside the United States was disappearing into "unreported holdings."

The Bank for International Settlements in its 22nd annual report estimated that of 4,870 millions of dollars in gold produced in 1946-1951 inclusive, 2,180 million went into official gold reserves, while 2,690 millions disappeared, and that of this, 1,490 millions went into private hoardings. In the six months ending March 31, 1952, only 2½ percent of world production was added to world monetary stocks. That hardly indicates confidence in paper currency. It indicates that people by one device or another are managing to get their hands on gold.

In September, 1951, Mr. Ivar Rooth, managing director of the International Monetary Fund, threw in the sponge and announced that member countries could decide for themselves how to implement the gold policy. And in a burst of advice, he said:

"The only dependable way of getting rid of premium markets and private holding is to create economic conditions under which the private demand for gold will become negligible. . . . In every country, the best way to reduce the demand for gold for private hoards is to follow budget and credit policies that will give people confidence in their currency."

That, the National City Bank places alongside of this statement in the 1952 report of the Bank for International Settlements.

"It is an object lesson for all and sundry that, if supplies of gold are allowed to move freely and if confidence in the national currencies is restored, these two factors are capable of putting an end to gold hoarding, after all attempts at suppression by means of prohibitions and controls had failed."

In other words, the free convertibility and free use of gold must go along as hand maiden to the restoration of confidence by budget and credit policies because the very essence of a false budget and credit policy is the issuance of paper money.

Mr. Rooth's advice is not to be questioned. "The best way to reduce the demand for gold hoards is to follow budget and credit policies that will give people confidence in their currency," but as is implicit in the comment of the Bank for International Settlements, the best way for a government to give people confidence in its currency is to make it freely exchangeable for gold.

And that is precisely the whole point—gold combats inflation if allowed to work. Governments must follow sounder fiscal policies when their currency is exchangeable for gold. Governments give to their people the pledge of sound financing when they will exchange gold for notes of their own issue. It is the pledge of not spending money beyond the point which current revenues and low-interest bonds will meet.

One Example A Success

Fortunately, the world has the example of one government that is taking this advice to heart—that is France. Premier Pinay last spring announced a gold loan, in which the purchaser was guaranteed against depreciation of the franc by promising payment in gold coin. That at least

guaranteed against loss of principal. Reports indicate that the trial was at least moderately successful, that gold has come out of hoarding to a considerable extent, and that the government is now considering a new issue in which not merely principal but interest earnings will be guaranteed in gold. Coupled with this step, the Pinay government proposes retrenchment in spending and a balanced budget. Thus, the two go hand in hand.

What Has Delayed Us?

There are three reasons, it seems to me, why our own government did not face up to this situation. There may be more, I mention three:

(1) Pride of Authorship.
(2) Problem of Pricing.
(3) Inertia of Position.

First, the Pride of Authorship. Having spawned the idea that gold was nothing for the private citizen to have, that public debt meant nothing if the money was owed to ourselves, government policy-makers couldn't quite bring themselves to admit that they were mistaken.

Moreover, if convertibility of gold needs to be accompanied by budget balancing and the end of deficit financing, except for clearly defined defense needs, it would be awfully hard to deliver on sundry promises for social programs. Indeed, the argument was seriously advanced that a large public debt is a good thing as a place to invest collections for social security trust funds.

Personally I was never impressed by that argument. It has seemed to me that money is more likely to produce new wealth if invested in private enterprises; and government trusts might appreciate more by accumulating interest from the earnings of private investors borrowing from banks than by raising taxes to pay the interest on public debt.

Pride of Authorship, however serious an obstacle it may be, is not an insuperable one. Policy-makers who are reluctant to restore full recognition to gold, can be changed. The remedy is that simple.

Second, the Problem of Pricing. This is related to the Pride of Authorship. It is hard to explain why the price of gold should be higher in the open markets of the world if you cling to the notion that some kind god in government at home gave gold miners a good deal in 1934. And if that myth did get a jolt when Order L-208 closed the gold mines in World War II, it still took a little sword-swallowing to admit that inflation turned loose by deficit financing hurt the gold miners, too.

Mr. Guy Bjorge, general manager of the Homestake Mining Co., when asked about the advance in mining costs, gave this example:

In 1926, Homestake, with gold at $20.67 an ounce, made $1,100,000. Had they produced in 1950 exactly the same amount of gold and by the same methods as used in 1926, instead of a profit in 1950 with gold at $35, they would have had a loss of $1,500,000!

Many another mine operator could give similar figures on the effect of higher costs, higher taxes and the whole round of inflationary effects upon his own operations. But it is peculiarly ironical when the fruits of the non-convertible policy on gold clips the gold miner himself and, at the same time denies him access to the world market for his product.

Personally I have every sympathy in the world with the wheat farmer—and my personal business interests today are farming or ranching—but this is something of a commentary on the whimsy with which policies are pursued. The wheat grower gets the full market of over $2 for his wheat which the government delivers to an international buffer pool for $1.60. At the same time the gold miner must deliver his product to the government for $35 which it in turn will deliver to a foreign account at that figure plus handling and permit the owner of the foreign account to make a profit on selling in a premium market, reserved for that foreign broker and the foreign producer.

Thresh Out Price Problems

This problem of pricing is not easy, but not unsolvable. Senator McCarran of Nevada has suggested at various times that a trial period would let gold find its level. Other possibilities would include either a direct mandate by Congress based upon staff studies in congressional committees or the creation of a commission to make a finding upon the basis of precise standards prescribed by the Congress.

It is true, of course, that the Constitution states that Congress shall regulate the coinage and fix the value thereof. The use of Commissions or Boards or other instrumentalities has been held to be constitutional when they were clearly designated as simply the agents of the Congress to act upon certain definite standards and to make findings within fixed limitations.

Perhaps the entire matter of price can be thrashed out in the Congress but the possibility of speculation as a bill works through both houses and committees might argue for the use of the agent to make a finding upon prescribed standards.

In any event, Congressional action will be needed but it will require executive leadership to overcome the third problem I have cited—the Inertia of Position.

It is often said that Congress acts only when there is a crisis. That overstates the situation. But it does seem even to a Congressman, at times, that we are in the position of the old fellow who never fixed his roof. When it was raining, he couldn't; and when it wasn't raining, he didn't need it.

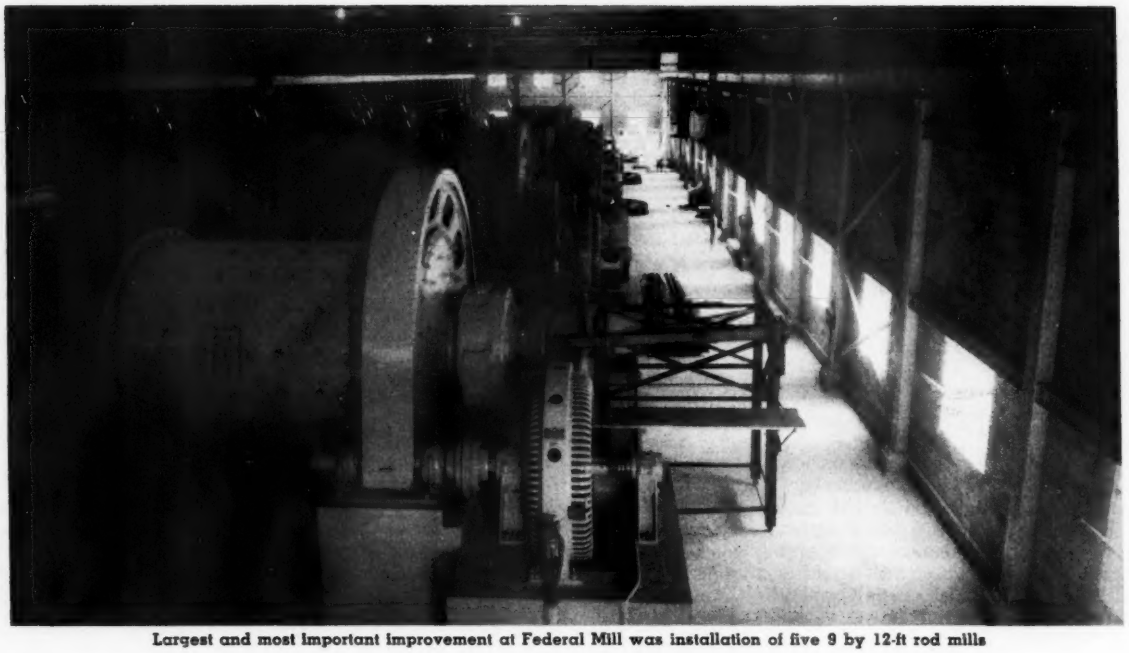
There is another explanation, however, when it comes to this subject of the gold standard. Few people feel competent to argue about it, one way or the other. Fewer still feel a responsibility for taking the initiative; and those of us who come from mining states hesitate to advance the cause of gold lest we seem to be talking for local interests on a national problem.

Action Demanded Now

The time has come, however, when the economist, the engineer, the financier and the miner must join hands in saying to the new administration that the welfare of the country demands recognition by the United States of the full part that gold can play in combatting inflation and in restoring economic health to the nation.

The pretense that gold is out-moded is refuted by the very searching for dependable values noted in the report of the Bank for International Settlements. The idea that it is simply another commodity is denied by the fact that people of every land will exchange labor and goods for it whether it be minted or not. Not since trade began has man found its equal as a yardstick or as a medium for facilitating exchange. All these would be points in favor of resumption of a gold standard with full convertibility.

Today, however, to all such arguments is added the need for an effective curb for the fires of inflation. Every producer in whatever field, every buyer of goods in whatever field, every worker in whatever field, will benefit if government and citizen can have the self-insurance which goes with the substantial guarantee of lasting values given in terms of gold.



Largest and most important improvement at Federal Mill was installation of five 9 by 12-ft rod mills

Developments in Milling Practice In Southeast Missouri

Wet Grinding Rod Mills Replace Dry Crushing Rolls. Sink-Float Separation Applied Where Ore Is Adapted to Such Treatment

By NORMAN A. STOCKETT
Formerly Gen. Mill Superintendent
St. Joseph Lead Co.

THE northern end of the lead belt of Southeast Missouri is about sixty miles south of St. Louis. The lead belt is the largest lead mining district in the United States and has produced more than 7¼ million tons of metallic pig lead. Capacity of the mills operated by the St. Joseph Lead Co. in Southeast Missouri is as follows:

Mill	Tons Per Day
Bonne Terre	3,200
Desloge	5,000
Federal	16,000
Leadwood	6,000*
Hayden Creek	2,000
Mine La Motte	1,000

New Rod Mill at Federal Mill

Most important and largest recent improvement at the Federal Mill is the elimination of six sets of 48-in. diameter x 24-in. face dry crushing rolls, and the replacement of this equipment by five nine-ft diameter x 12-ft long wet grinding rod mills.

* This 6,000-ton capacity includes 900 tons of "Sink" product trucked from the Hayden Creek Plant to the Leadwood Mill for further beneficiation.

To house this equipment, a structural steel and tile building 264 ft long and 53 ft wide was erected.

Each of these five overflow type Allis-Chalmers wet grinding rod mills is driven by a 450-hp, 257-rpm, three-phase, 60-cycle, 440-v unity power factor synchronous motor having 160 percent starting torque, 140 percent pull-in torque and 225 percent pull-out torque.

These rod mills have machine welded steel plate shells and cast steel trunnion heads with the trunnion cast integral. The end liners are manganese steel and are zinced in place. Lorain liners, made of high carbon rolled steel, and consisting of separate lifters and liner plates are used without any backing for lining the shell. The lifters are made reversible and are readily renewable without removal of the liner plates.

Trunnion bearings are of the ball and socket babbitted shell type 40-in. diameter x 20 in. long. They are oil lubricated by two oil buckets attached to the trunnion. In starting, an external hand operated Farval high pressure oil pump is used to float the mill in the trunnion bearings so as to reduce the starting torque required for the initial rotation of the mill.

The main gear is a cast steel, cut tooth, Wuest herringbone type split gear installed at the discharge end of the mill. The steel pinion is forged integral with the pinion shaft and made of suitable length to be reversible. A Falk flexible coupling is used between the motor and the pinion shaft. The countershaft speed is 257 rpm, giving a mill speed of 16.5 rpm, which is about 62 percent of critical speed. Four hundred and forty-six hp is required, at 16.5 rpm, for operating the mill with the 45 percent initial rod charge consisting of 60 tons of rods.

Each rod mill weighs 80 tons including liners but without the 60-ton normal rod charge. The initial rod charge is made up of an equal weight of two-in., 2½-in. and three-in. diameter rods, 11 ft 6 in. long. Three-

in. diameter rods are used for replacement charging.

The dust problem will be simplified since practically no dust is made in wet grinding as compared to dry crushing in rolls.

Elimination of the rolls and dry screens will increase the capacity of the secondary crushing plant from about 650 tons to 1000 tph. It will then be possible to operate the crushing plants on a two-shift instead of a three-shift basis.

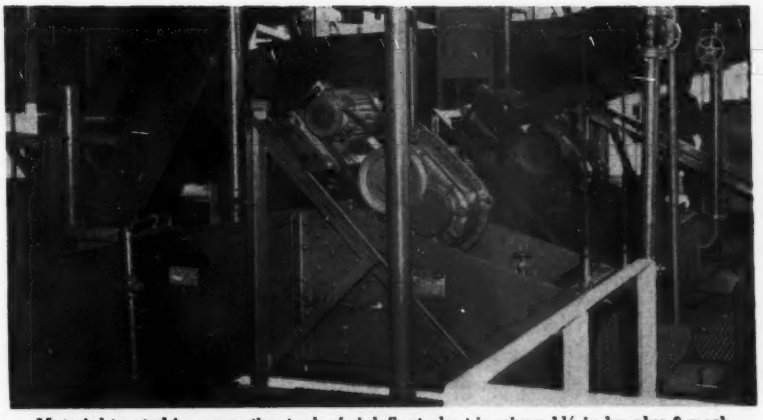
This increased crushing rate permits more tons of ore per hour to be hoisted thereby eliminating many of the delays due to a full pocket in dumping ore trains underground.

It is estimated that after this conversion, it will be possible to make a net reduction in the mill organization of 20 operating and maintenance shifts per 24 hours besides eliminating the large cost of replacing dry screens, maintaining the switch back conveyors to the dry screens, etc.

Cone Crushers Installed

Six 5½-ft Symon's short head cone crushers, all steel construction, with coarse crushing bowl, were installed in the Federal secondary crushing plant in 1948 to increase tonnage and reduce costs.

These crushers are set to make a one-in. product. Formerly, after screening out the undersize, the oversize went to the rolls. Now the screens have been eliminated and this one-in. product is conveyed to the mill storage bin where it is fed to the rod mills. To obtain finer crushing, a step mantle and a step bowl liner are being used in one of the Symons' cone crushers. This change is satisfactorily making a finer sized product.



Material treated in separation tank of sink-float plant is minus 1¼ in by plus 6 mesh

Reclaim Chat

Approximately 7,000,000 tons of reclaimed chat have been milled since the remilling of the coarse chat piles (table and jig tailings) was started in 1947. At present, about 7,000 tons of chat are being milled daily.

Most of the chat remilled is loaded by power shovels into trucks and then hauled to the mills—in some cases, as much as a five mile round trip. At two places, where the chat piles are adjacent to the mills, a combination of the scraper and belt conveyor system is used. At the Desloge Mill, the scraper and conveyor method is used to transport the chat about 500 ft to No. 86 Marcy ball mill. After grinding the chat in open circuit to —10 mesh, the discharge of the mill, after dilution to about 50 percent solids, is pumped through a five-in. pipe line to the basement floor of the concentrator, about 1200 ft distant and 71 ft higher in elevation. Pipe line transportation, where there is sufficient tonnage to amortize initial installation, has proven to be the most economical method per ton mile for transporting this sized material.

About 10 miles of company owned and maintained roads have been built and are used exclusively for the trucking of ore and chat to the mills. An average of 50 truck shifts per day (all contract) are required for this haulage.

The 450 hp synchronous drive motor is direct-connected to pinion shaft through flexible coupling

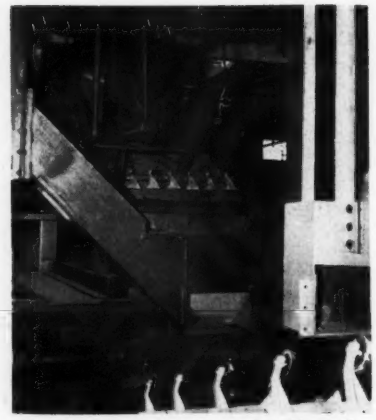
Zn-Pb Circuit At Desloge

In order to increase the capacity of the zinc-lead section of the Deslodge Mill to a total of 2400 tpd, two Allis-Chalmers six-ft six-in. diameter by 12-ft 1-in. long wet grinding overflow type ball mills were recently installed replacing two four-ft diameter by 10-ft long mills. Each of these new ball mills reduces approximately 800 tons of 20 percent +14 mesh feed to flotation feed (20 percent +100 mesh). These ball mills operate at 21.9 rpm (70 percent critical speed) in closed circuit with a 63-in. inside diameter by six-ft deep St. Joe type tub deslimer. Each mill is driven by a 250-hp, 353-rpm wound rotor induction motor, direct connected by a Falk coupling to the pinion shaft. "Wuest" type herringbone cut tooth gears are used; the main gear is a solid one-piece gear. Manganese shell and end liners are used with zinc backing. The wave type shell liners are three in. thick.

The undersized from the dry screens in the crushing plant (at 20 percent +14 mesh) is fed from the ore bin, pulped and then pumped to a St. Joe tub deslimer. The overflow, about 85 percent—65 mesh at 35 percent solids, after conditioning, is fed to the flotation plant.

Reclaim Chat At Desloge

One six ft, six in. diameter by 12 ft 1 in. long rod mill, similar to the two new ball mills, has been installed in the "reclaimed chat" circuit at Des-



Hummer screen removes plus 20 mesh materials from medium

loge to increase the capacity to a total of 2600 tpd. This rod mill is operated at 19.3 rpm (61.7 percent critical speed) and is driven by a 200-hp, 353-rpm wound rotor induction motor. Sixty-one thousand lb of rods are required for the 45 percent rod charge. One and one-half in. diameter rods are used for replacements.

In milling reclaimed chat, the table tailings are considerably lower in grade than the flotation tailings. Hence, to meet this condition in grinding it is more economical to use a rod mill than a ball mill, since it produces a minimum of slimes and a maximum of granular material for the tables.

Mineral Jigs

In the zinc-lead section of the mill, the spigot from each tub deslimer (a separate tub deslimer for each ball mill) flows to two, two by three-ft mineral jigs in series. These jigs make a coarse and a fine hutch lead concentrate respectively which combined averages about 75 percent Pb, 1 percent Zn and 1 percent Fe. The overflow from the jigs is then fed to the ball mill. The discharge from the ball mill is pumped back to the tub deslimer which is in closed circuit with the ball mill. The free galena is recovered not only before the crushed ore is fed to the ball mill but also from the ball mill discharge before the ore is slimed for the flotation plant.

Feed to the jig is unclassified and undeslimed. Approximately a 2.5 circulating load equivalent to 2000 tons per 24 hr is fed to each set of jigs (two in series). Typical jig feed is 16.6 percent on 20 mesh. Average size of concentrate made by the first hutch is 34.7 percent on 20 mesh and by the second hutch 9.2 percent on 20 mesh.

Weld Crushing Rolls

A mechanical roll welding machine has been in service several years at the Federal Mill for hard surfacing roll faces. The roll shaft is supported in a horizontal position by a bearing at each end and can be rotated at the speed desirable for most efficient welding. Either $\frac{3}{16}$-in. diameter or $\frac{1}{4}$-in. diameter welding wire is fed from a reel through the welding head directly above the face of the roll. All the welding is done under flux which gives a deeper penetrating and a more abrasion resistant weld. Rolls from five different mills are hard surfaced here. First a base or lower coat is welded on and then the cover coat, which is a harder material. The advantages, compared to manual welding, are:

(1) About 25 percent of the number of welding hours are required as compared to manual welding.

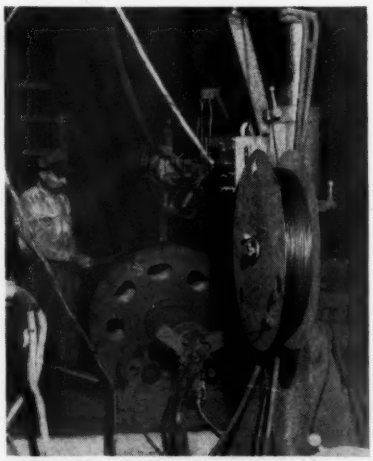
(2) The welding is deeper penetrating, more uniform and wears longer. At Federal, the average life of hard surfaced manually welded rolls was 30 operating days. With mechanical welding, it is now over 50 days and some sets have been in service over 80 days.

(3) Elimination of visible arcing thus saving eye injuries.

(4) A big reduction in the cost of hard surfacing rolls per operating day.

Save Power in Water Supply

At one time, practically all the mill water used at the Federal Mill was pumped into a mill tank, about 90 ft above ground level. This method was very wasteful in the use of power since most of the water was elevated much higher than was needed for the place where it was used. A group of pumps, each one designed to elevate the water only to the horizontal zone or level at which it is used, was installed and a saving in power of approximately $100 per day has been made.



Hard facing of rolls-faces with mechanical welding machine prolongs surface life over 100 percent in some cases

Handling Concentrates

A two-ton rubber tired tractor shovel is used for loading filtered zinc concentrates from the bins into the box cars. It has a 6½-ft turning radius and is equipped with a 10-cu ft bucket. Its small turning radius enables it to be driven to most of the places in the mill. It transports supplies, motors, etc. in the bucket and hauls rod mill rods, etc. on a small four-wheel rubber tired trailer. The first tractor proved itself so valuable to operations that two more were put in operation at other mills.

All steel constructed elevating conveyors consisting of two strands of chain with cross bars that drag the ore and chat over a steel bottom plate, fabricated to steel side plates, are used to convey and elevate mine ore and chat from a hopper, into which it is dumped by trucks, to the head shaft sprockets where it is fed to the crusher. Two 40-in. conveyors of this type have been installed and are operating satisfactorily in places where a pan or apron conveyor would formerly have been used.

Disc filters are gradually replacing the drum or cylindrical type of filters for dewatering flotation concentrates. The lead flotation concentrates are dried in gas-fired cylindrical dryers before shipment. The zinc concentrates are shipped after filtering.

The Dorrco filter is used for dewatering gravity concentrates before shipment.

Wet instead of dry vacuum pumps are being used in our latest filter installations.

In order to measure the large flow of tailings and determine the tonnages of tailings from the various flotation plants, several of the mills have installed Parshall flumes. They are operating satisfactorily.

Tailings Disposal

Seven 48-in. spiral classifiers, replacing the drag classifiers have been installed at the Federal Mill for dewatering table tailings. This change was made principally to reduce maintenance costs.

Fifteen thousand tons of a mixture of table and flotation tailings per day at the Federal mill are disposed of by the use of three 10-in. pumps in series pumping this material at 50 percent solids through a 12-in. pipeline over 8000 ft long to a large settling area behind the Davis Creek Dam. In order to reclaim the clarified water and protect the dam against heavy rains, flash floods, etc., a large concrete tower and connecting tunnel extending from the tower out through and beyond the dam was erected at a cost of over $100,000. The tunnel

consists of three compartments: one compartment three by eight ft to supply reclaimed water for the two mill pumps and two compartments eight by eight ft for controlling the discharge of surplus water from the large pond back of the dam to Davis Dam.

Zinc-Lead Mill Circuits

A 1200 tpd reclamation plant for remilling a 2,000,000-ton chat pile at Leadwood and recovering both a lead and a zinc concentrate was erected adjacent to the Leadwood Mill. It is operated independently of the main mill circuit. Shipments of concentrates started in October, 1948.

At the Desloge Mill, part of the mill was converted to the milling of low-grade zinc-lead ores. The present capacity is 2400 tpd. This circuit operates independently of the main mill which mills reclaimed chat too low in zinc content to be recovered. Shipments of concentrate started in September, 1950.

A bulk flotation concentrate is made at both of the above all-flotation plants. After conditioning this concentrate, a differential float is made of the lead concentrate leaving the remainder as a zinc concentrate.

Sink-Float at Hayden Creek

Hayden Creek ore is decidedly different from the typically dolomitic ore of the "lead belt" in that, at Hayden Creek, the ore is a conglomerate consisting of granite boulders cemented together by a sandy dolomite. The solid granite boulders do not contain any galena. A very small fraction of the galena occurs in some of the granite boulders that have been fractured or broken. Practically all the galena is found in the cementing dolomite around these boulders.

An ore of this type of mineralization is very well adapted to the sink-float process, principally due to the comparatively large differential between the specific gravities of barren granite, the gangue material (varying from 2.52 to 2.60) and dolomite 2.85 which is mineralized. The specific gravity of the dolomitic ore increases as the percentage of lead increases, being about 2.92 for a three percent Pb.

The sink-float process is not the most efficient process for beneficiating the comparatively soft dolomitic ores at the other mills in the lead belt. However, it is the most economical method of processing Hayden Creek ore.

The size of the ore bodies and the adaptability of this ore to the sink-float process warranted the erection of a 2000 tpd (approximately 85 tph) sink float plant at Hayden Creek. The "Sink and Float" corporation's "H & H" galena medium process is used.

Tests indicated that, at present, the maximum economic size at which this ore could be separated is 1¼ in. and that approximately 50 percent of the mine ore could be rejected as a float material (1¼ in. +6 mesh) assaying about .15 percent Pb. This float or reject material, practically all granite, is very abrasive and would cost considerably more per ton to concentrate than the regular dolomitic ore of the "lead belt."

It was decided, for economic reasons, to locate the sink float plant near No. 22 Mine, Hayden Creek, instead of at Leadwood, principally to save the cost of trucking about 50 percent of the original mine tonnage to the Leadwood Mill which, by truck road, is about 3.7 miles.

"Float" and "Sink" products are carried to separate bins on parallel conveyors

Primary crushing of the ore is done underground by a 4040 Cedar Rapids double impeller impact breaker, having the impellers rotating away from each other. Each impeller is driven by a separate motor using a V-belt drive. The crusher weighs approximately 65,000 lb and has a large 40 by 40-in. inlet opening. Capacity in open circuit is over 300 tph, crushing run of mine ore through 3 in. The speed of the impellers is the most important factor in determining the size of the product. The crusher discharge is conveyed and dumped into a 300-ton underground pocket, then loaded into skips, hoisted and dumped into a 70-ton surge bin from which it is fed to any or all three of the 5-H Telsmith secondary crushers by Jeffrey vibrating grizzly feeders. These crushers are operated in open circuit and are set to make a 1¼-in. product.

The size of the material treated in the nine by nine-ft steel separation tank of the sink float plant is —1¼ in. +6 mesh. A flotation plant, entirely separate from the four-cell medium cleaning plant, treats the —65 mesh size material produced by crushing, making a flotation concentrate that is filtered, dried and trucked to Leadwood for shipment to the smelter.

The "float" product and the "sink" product are transported from the sink float plant by separate inclined belt conveyors to a 750-ton "float" bin and a 500-ton "sink" bin, respectively. Truck haulage is used for the disposal of these two products.

In addition to the many savings regularly made by the use of the sink float process, such as reducing the tonnage of ore to be hauled and milled, there is a large potential market for the discarded crushed granite for concrete aggregate, ballast for railways, etc.

Ore at Hayden Creek is amenable to treatment by Sink Float process so plant was built there

Continuous Mining Review

(*Continued from page 53*)

bor and the consumer seem to have joined forces now to claim a major share of the profits.

Wages in the industry have increased from $13.05 per day in June, 1948, to $18.25 per day in October, 1952, a total of 39.8 percent. Supply and administrative costs and taxes increased proportionately.

The price of coal to the consumer has remained almost stationary, the average of 1948 being $4.99 compared to $4.87 estimated for 1952, a decrease of 12 cents per ton or 2.4 percent. The industry has in addition thereto been forced to absorb, as an item of cost, the added burden of 30 cents per ton contribution to the United Mine Workers of America Welfare Fund over the same period of time.

Competition and increased production of the new machines should tend to decrease their cost price to an acceptable degree.

LABOR COST—The savings in direct labor costs is real. The combining of the separate processes of cutting, drilling, blasting, and loading, which require from four to seven men, necessarily results in a shrinkage in manpower to one or two men. Varying with the mining areas, where past practices and labor contract stipulations differ, the unit savings vary from two men on a small crew to six men on a larger one. The average reduction in total sectional labor is close to 35 percent, and the saving amounts to 20 cents per ton at mines having a sectional labor cost of around 55 cents per ton, and 50 cents or more where the sectional labor cost is around $1.50 per ton.

SUPPLY COST—There is little, if any, prospect of reduction in the cost of supplies as long as wages generally throughout the country are permitted to rise. Here again it is a problem of reducing the quantity required to mine out a given area. One of the major items of "supplies" is contained in the element of roof control. Any reduction in this item also involves a direct saving in "handling" labor. It naturally follows that where roof strata and conditions worsen, control supplies and their cost increase proportionately, and efficiency of any production unit is lessened.

"Continuous mining" can help with this problem. The solution should be approached from the standpoint of limiting exposure of equipment and personnel to the hazards of roof falls to a minimum. This can take the form of mining pillars and entire panels from rooms or entries with relatively narrow openings or lifts, and with equipment specially designed for the purpose—augers, or combination machines of present design, somewhat modified and operated with remote controls.

Some experimentation along these lines has already taken place, but only an aggressive approach can be expected to develop the idea to a successful conclusion within a reasonable period of time. The tendency to abandon either temporarily or permanently those areas which are classified as "bad roof" in any mine and by all organizations, and accepted by top management because they are invariably "high cost" and unprofitable, cancels out the lowered recovery involved in the type of panel mining suggested above. The percentage of recovery which can be attained without inviting squeezes must be carefully determined for each mine.

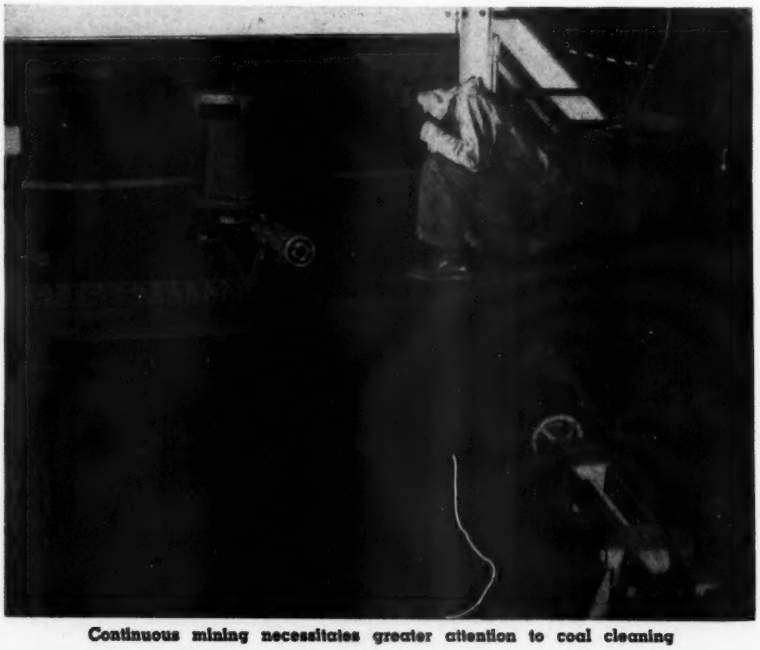
In Conclusion

A limited study of the effect of continuous mining on conventional mechanical loading costs indicates that the following changes may be anticipated:

A decrease in Production Labor cost of	42%
A decrease in Production Supply cost of	19%
An increase in Maintenance Labor cost of	80%
An increase in Maintenance Supply cost of	80%
An increase in Power cost of	5%
A decrease in other Operating costs of	15%
A decrease in Total Production Cost of	22%

It should be thoroughly understood by anyone contemplating the mechanization of coal mining properties, that mechanical cleaning is a necessary part of the process. Mechanical mining and particularly "continuous mining" means full seam mining, except that top coal or bottom coal, or both, can be left unmined if desired.

There are still many people in the industry who fail to grasp the significance of the word "continuous," and its application to coal mine operation from face to railroad car or market. Lack of continuity has been one of the leading handicaps to progress throughout the industry's existence. We have been recognized by the public at large as a seasonal industry, with wage scales geared to a subnormal number of working days per year. When market conditions brighten and prosperity seems within our grasp, we are habitually plagued with a lack of continuity in railroad car supply. Lack of continuity in labor supply has latterly been limited to absenteeism. Our conventional mining practice has accepted an intermittent or cyclic type of operation. If we are to successfully meet the challenge of substitute fuels, it will be necessary for the industry to adopt some of the principles of mass production successfully employed by other basic industries. The most important of these is continuity of production and movement in quantity with a minimum of interruption and non-productive motion. The approach to "continuous mining" differs so radically from the accepted thinking and planning for conventional mining practice, that much valuable time may elapse before it is accepted as a "system" by the industry.



Continuous mining necessitates greater attention to coal cleaning

Changes Needed in Internal Revenue Code

Remarks Delivered at Conference of Joint Committee on Internal Revenue Taxation and Members of American Mining Congress Tax Committee

By Hon. Dan Reed*
Chairman House Ways and Means Committee
and
Chairman Joint Committee on Internal Revenue Taxation

IT affords me great pleasure to be present at this meeting of our technical staff and representatives of the American Mining Congress. The mining industry is vital to the welfare of our country. Without exploration and development of our natural resources, it will not be possible to have a strong and dynamic economy.

You state in your brief that practically every provision of the Internal Revenue Code affects in one way or another all or some of the mining industry. This is one of the reasons why I feel that the entire Code must be completely overhauled. A patchwork job of amendments here and there will not meet the needs of our present economy. Many of the provisions of the Code go back to Civil War legislation and are not applicable to present-day situations. Your suggestions show that you are concerned about the excess profits tax, many income tax provisions, and the transportation tax on freight. All of your suggestions will be very helpful to our committee in framing tax legislation.

In regard to the excess profits tax, the Committee on Ways and Means shares your view that the excess profits tax should terminate, as scheduled, on June 30, 1953. Not only is this tax depressing our economy in both its production and expansion but it is also woefully defective as a revenue producer. In fact, it is my well-considered opinion that the government will actually lose revenue if the excess profits tax is continued. The tax is preventing revenue dollars from being realized by holding back production and expansion. It is also reducing income, which has already been realized, by stimulating wasteful and inefficient practices which result in tax deductions. If we are ever to have a dynamic economy and to encourage new and growing businesses to move ahead, this tax must expire as scheduled. It has no place in an economy which is so dependent, as our present economy is, on the free enterprise system.

I feel that there are two provisions of the Internal Revenue Code which have played a most vital part in the development of our natural resources. I refer to the provision relating to percentage depletion and the provision allowing the taxpayer to deduct as a current expense exploration and development costs. These provisions have acted as a powerful stimulus in providing incentives for the creation of capital to search for minerals of uncertain location, quality and extent. I realize that these provisions have been under frequent attack in the past, but the Congress has withstood all efforts to destroy or weaken them.

I feel that the results achieved up to the present time in the development of our natural resources has fully justified our efforts in this respect. It is mainly because of such incentive provisions that the country has been able to produce within its borders most of the minerals it needed for defense and civilian purposes. But the situation is not a static one by any means. It has been estimated that in the next twenty-five years the requirements of the country for all minerals will be between 50 and 60 percent higher than 1950. As our needs for minerals increase, we must put forth every effort to explore and develop new fields.

It is, therefore, very important that the provisions of the Code relating to minerals should be reexamined *de nevo* to see if they contain requirements which are harmful and obstructive to the production of our natural resources. The ambiguity of many provisions should be reviewed. They should be clarified and made more understandable. Underlying principles upon which many provisions are based should be reexamined to see if they are unfair or needlessly complicated. Perhaps you have been confronted with regulations or court decisions which impose ponderous and unrealistic procedures, resulting in loss of time and waste of manpower. I hope you will advise us as to such provisions and possible solutions.

I believe that you gentlemen are particularly well qualified to point out the inequities, complications, and inadequacies of the present Internal Revenue Code. We must not be satisfied with a partial job. This year we have an opportunity to do a complete and thorough job. However, this will be possible only if we can secure the wholehearted cooperation and help of groups such as yours. In this year of decision, I know that I can count upon your help and support. If you and other groups give us your support, I am convinced that we can meet our goal to have an Internal Revenue Code ready for enactment at the beginning of next year. Of course, due to budget limitations, we may not be able to go as far as we would like in all respects, but we can be assured of establishing fair provisions and principles.

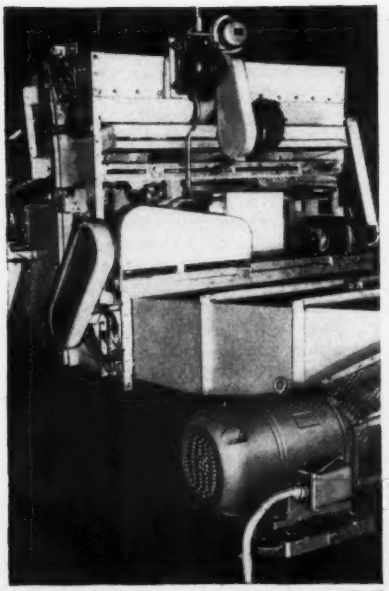
I know I can count upon your support and that you will not fail in this great undertaking for a new Code.

* Republican Member of Congress, New York.

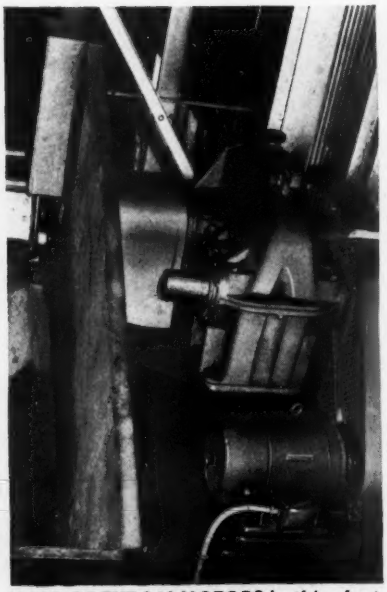
ENGINEERING REPORTS:

CENTRALIZED CONTROL of plant motors at Crown Mine's new preparation plant co-ordinates processing, saves steps, uses manpower most efficiently. This control desk, one of three in the plant, controls the operation of the loading booms.

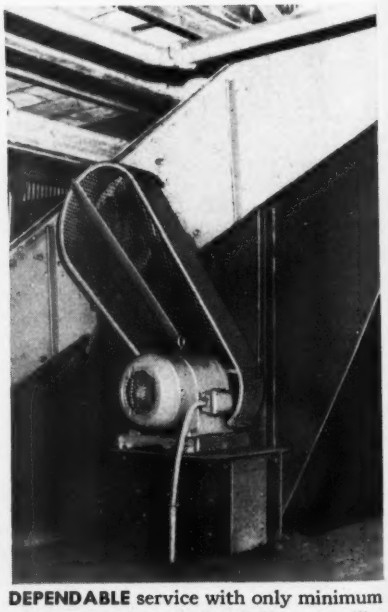
New coal plant cuts downtime



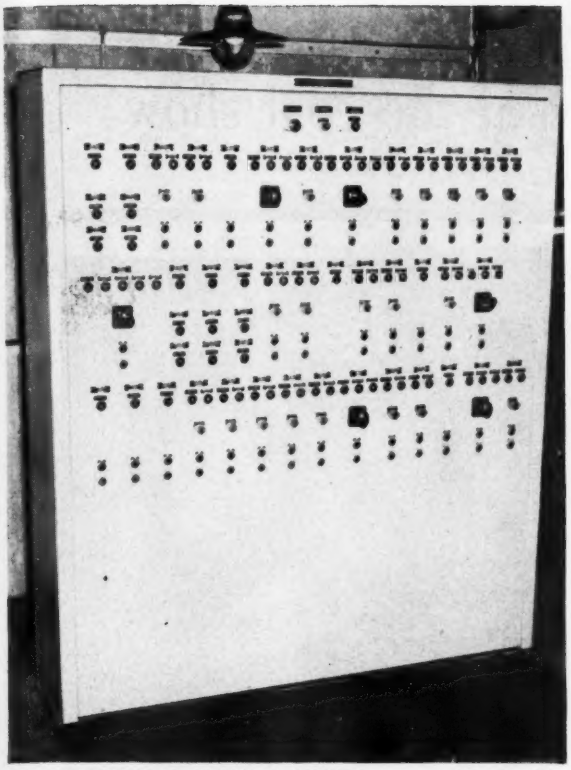
PROTECTED against coal dust, this G-E totally enclosed fan-cooled motor drives an air-flow cleaner in the prep plant.



MOST OF THE 146 MOTORS in this plant, like this one driving a crusher, are G-E totally enclosed fan-cooled motors.



DEPENDABLE service with only minimum maintenance is typical of G-E motors, like this one driving an ROM apron feeder.



CO-ORDINATED CONTROL SWITCHES are combined with indicating lights in this panel benchboard on the jig floor.

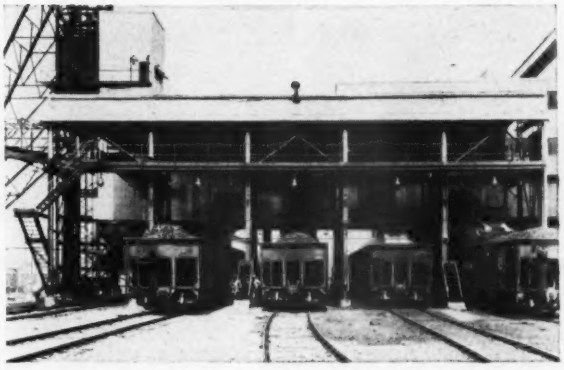
SEQUENCE OPERATION of plant motors is obtained through interlocks and timers in this G-E Cabinetrol assembly.

with co-ordinated G-E drives

Crown Mine uses G-E motors and control system-engineered to meet plant's needs

Freeman Coal Corporation's new Crown Mine preparation plant at Farmersville, Illinois, is a fine example of the way General Electric co-ordinates motors and control into a smooth-working system to maintain consistently high output at low cost. From self-dumping skips for ROM coal to automatic loading booms for clean coal, G-E system-engineered drives keep processing in step, minimize downtime, make most efficient use of manpower.

You, too, can profit by putting G-E engineering leadership to work on your preparation-plant problems. For more information, contact your local G-E Apparatus Sales Office, or write for Bulletin GEA-5308, "Electrified Coal Preparation," to General Electric Co., Section 663-31, Schenectady 5, N. Y.



LOADING BOOMS discharging into railroad cars are controlled from boom operator's cab (upper left). Sequence control utilizing G-E Cabinetrol co-ordinates conveyor operation.

Engineered Electrical Systems for Coal Preparation Plants

GENERAL ELECTRIC

See the U. S. Rubber belt technician demonstrate "Belt Surgery" at the coal show

Again this year, you have the unusual opportunity of watching a belt technician at work at the coal show. His remarkable skill has caused him to be likened to a surgeon. One of United States Rubber Company's technicians will demonstrate his matchless skill at splicing belts. He has made splices on "U.S." conveyor belt installations throughout the country. When you see how he splices and vulcanizes a belt, you'll get an idea of what U.S. Rubber means by installation perfection and belt maintenance. And be sure to pick up your free copy of "A Practical Way to Repair Conveyor Belts."

See you at the show, Booth 1215.

The U. S. Rubber Booth will also display hose, tape, rubber-lined pipes and fittings, V-Belts, packings, pinch valves, Uscolite® pipe and fittings, Royal-guard protective coatings and U.S. trolley guard rubber for the coal industry.

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U. S. Rubber Ustex-nylon slope belt carrying mechanically loaded Pittsburgh seam bituminous coal. It is 2900 feet long.

U. S. Rubber surface belt, 1000 feet long, receives coal from the slope belt, carrying it to bins. The belt system handles approximately 600 tons per hour.

A new mine in West Virginia makes full use of mechanized coal haulage. And when it came to selecting the conveyor belting, the mine officials specified U.S. Rubber's Ustex®-Nylon Belt. Two great textiles are combined in this belt: "U.S." patented Ustex for strength, Nylon for flexibility and unusual troughability. The great strength of this belt means that it can handle longer centers, higher lifts than any duck-and-rubber belt and weighs half as much for equal unit strength.

Get the most out of your haulage system by selecting U.S. Belting. There's no better way to keep haulage costs at a minimum. Call on any of the 25 "U.S." District Sales offices, each staffed with engineers—or write to address below.

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Galvanizing is but one of the many vital industrial applications where Eagle-Picher zinc plays a part. There may be a need for zinc, and for Eagle-Picher's practical research approach, in your own operations. We'd be glad to talk it over. Write today. Eagle-Picher Company, Zinc Sales Offices, Miami, Oklahoma.

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Holes loaded and ready to shoot.

Peak of blast. Confinement is good.

Spent gases appear—air blast avoided.

Well placed final pile. Throw controlled.

the inside story

Here's how ROCKMASTER® blasting helps control throw

THIS blast area on By-pass Route 22, Easton, Pa., was adjacent to gasoline storage tanks, homes, a parking lot, business establishments and a precision instrument factory. It was a ticklish blasting problem for Central Pennsylvania Quarry, Stripping and Construction Co., contractors on the job. Absolute control was a "must." Flying rocks had to be minimized . . . along with noise and vibration.

The ROCKMASTER pattern illustrated above was designed to keep blasted material from falling down the slope. The holes were carefully loaded and adequately stemmed. As the blast was fired, it advanced in alternate delay periods from ROCKMASTER No. 1 to No. 6. The row toward the slope fired first and gave relief for subsequent rows. The general heave inclined toward this relief—up the slope.

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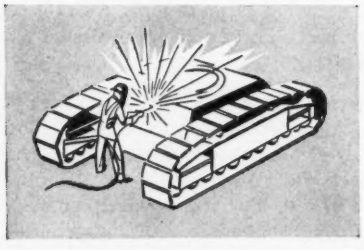

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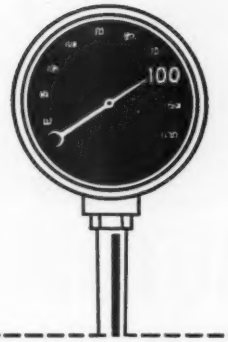

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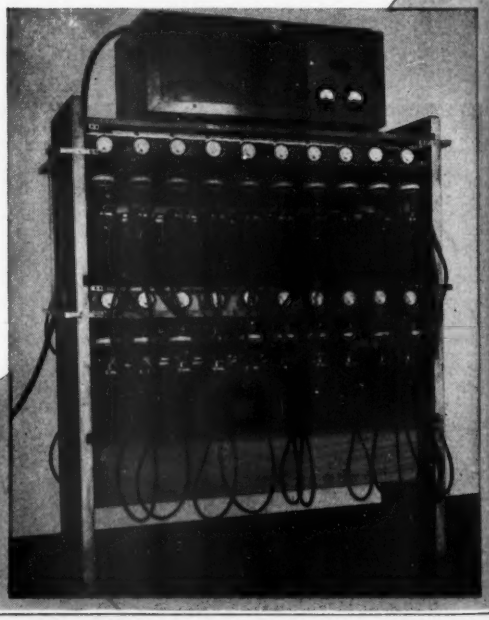

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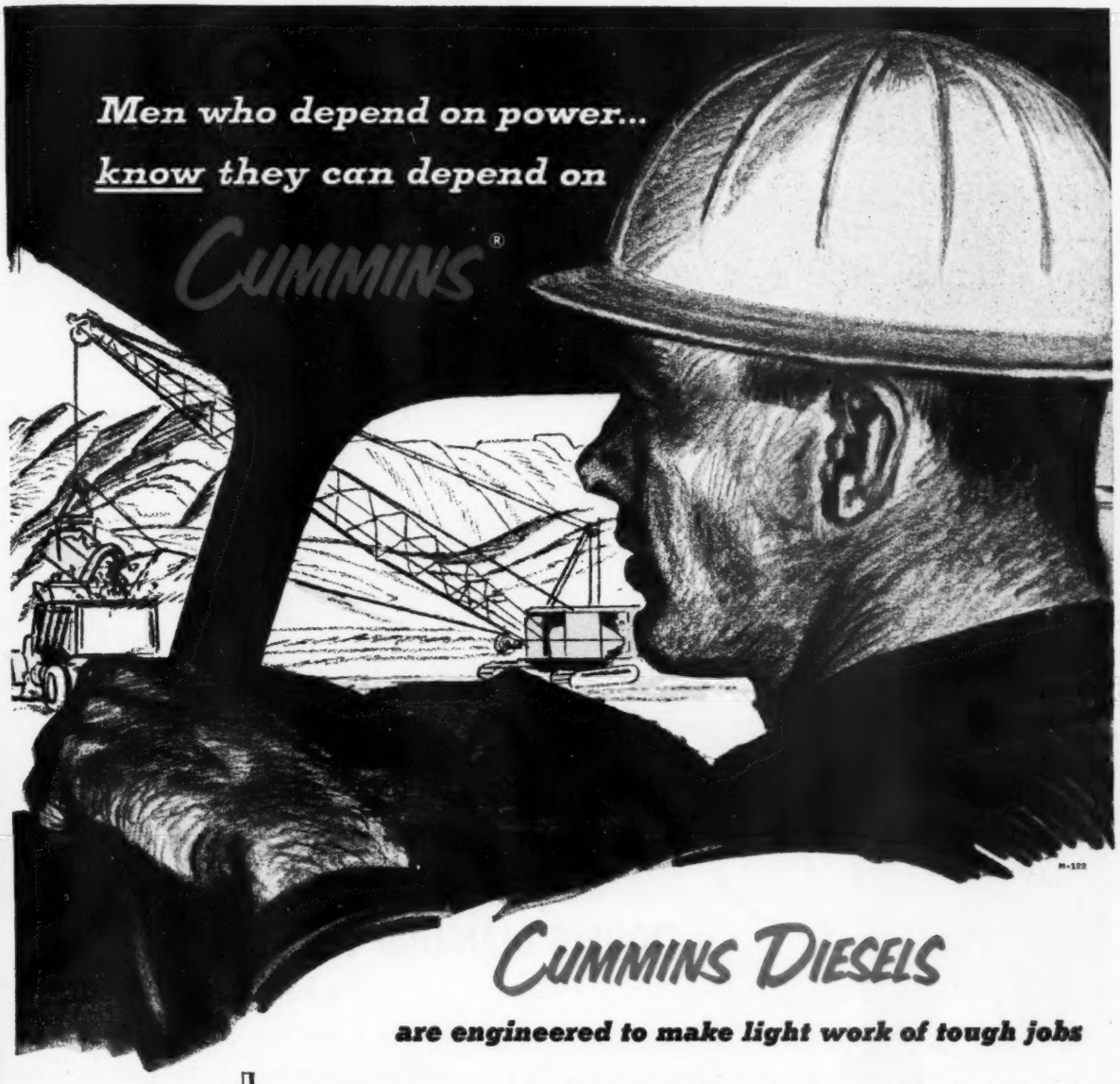

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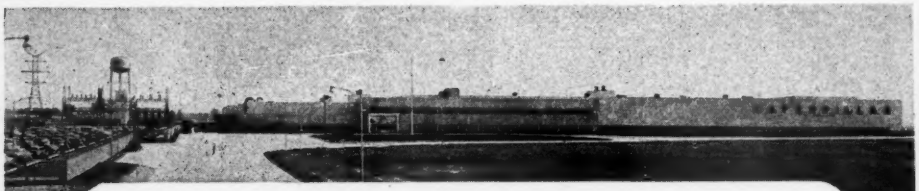

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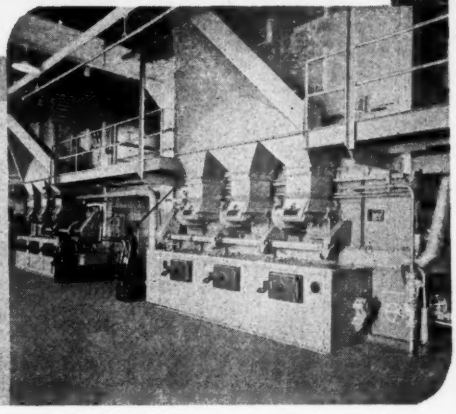

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For heat, power, process steam—coal is your best bet! Ask a consulting engineer. He'll show you how to cut both fuel and operating costs by burning coal in a modern plant designed to meet your specific needs.

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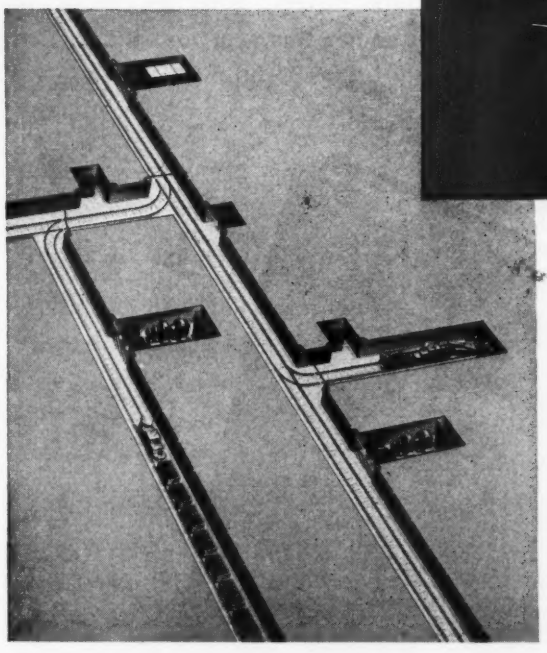

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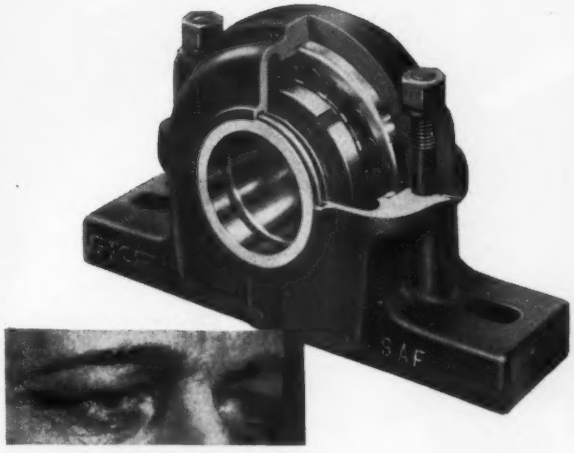

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Are You Hard Facing Effectively?

Considerable Savings are Possible in Mine Equipment Maintenance by the Proper Use of a Welding Machine

By HOWARD S. AVERY
Research Metallurgist
American Brake Shoe Co.

THE mining industry can save much by the effective use of hard facing. For those with equipment and maintenance responsibilities three steps can return generous savings. These are:

(1) Recognition of a situation where hard facing is feasible.

(2) Proper selection of the hard facing alloy.

(3) Proper application by welding.

Hard facing can be helpful in almost any place that wear is serious. Abrasive wear, frequently associated with impact, is a common problem in mining. The outstanding advantages of hard facing are (a) the readiness with which it can be applied to focal spots of wear, (b) the ease of application in the field and with portable equipment, (c) the economical use of expensive alloys (e.g. tungsten carbide), (d) the protection in depth it affords in contrast with case hardening, chrome plating and the like, and (e) the marked advantage of a tough base under a hard (but brittle) abrasion resistant surface.

Increase Equipment Life

Hard facing is reputed to increase the life of parts from two to 25 times. Specific examples include 10 to 18 times the life of plain steel for hard faced cement mill grinder rings (with further economy from elimination of nine replacement shut downs and 15 to 20 percent increase in production because of better machine efficiency); seven to 10 times increase in life of hammer mill hammers; a tenfold increase of brick machine feeder shoe life after replacement of cast iron; and a fivefold improvement of vertical pug mill push shoes. Hard faced power shovel dipper teeth outwore an ordinary set by 7 to 1; tungsten carbide insets increased the life of similar teeth before dulling from six to 120 hr, with improved efficiency; and armored dredge cutters that out-wore steel by 7 to 1.

Hard-Surface Bits

U. S. Bureau of Mines experiments in hard-facing cruciform bits for percussion pneumatic drills (below three in. in diameter) found that composite tungsten carbide weld deposits provided marked advantages over ordinary heat-treated steel in drilling oil shale.

Using standard Timken H. Type detachable cross bits, the results after thousands of feet of drilling with Gardner-Denver CF79, column-mounted, three-in., continuous feed, drifter drills show that a 2⅛-in. diam hole can be drilled at an average rate of 19 ipm with 84 psi air pressure at the drill. Bit price was 25 cents; each bit is resharpened twice at 10 cents per sharpening, and used three times. About five ft of hole was drilled between sharpening at a cost of 45 cents per 15 ft or 3 cents per ft of hole.

When the bits are hard surfaced by applying composite tungsten-carbide oxyacetylene weld deposits from a 5/32-in. diam mild steel tube rod containing 50 percent carbide granules below 30 mesh and subsequently heat treated by hardening (1450° F, ½ hr, W.Q.) and tempering (300° F, 1 hr), they can be depended upon to drill 100 ft of hole without failing or losing gage. The 25-cent bits cost 50 cents to hard face, providing 100 ft of hole for 75 cents or ¾ cent per ft. The hard-faced bits may drill up to 200 ft with some loss of drilling speed.

Coal crusher teeth can be rejuvenated in place with one-third the labor required to replace them

Hard facing thus reduces the cost of bits by 4 to 1, but the principal saving is in the cost of drilling labor (changing drill rods, shifting position of the drill and changing bits).

Save Labor Costs

Another good example of effective hard facing was demonstrated at a coal mine where replacement of coal crusher teeth formerly required 75 manhours. Present practice uses about 25 manhours' repair time and the hard-faced teeth wear better than the original teeth. The points, if not worn more than ½ in. are built up with a Cr-Mo martensitic iron deposit. If wear is greater, the build-up is with high carbon or 25 percent Cr: 20 percent Ni stainless steel, topped with two layers of the Cr-Mo iron. The hard facing operation is done without removing the teeth.

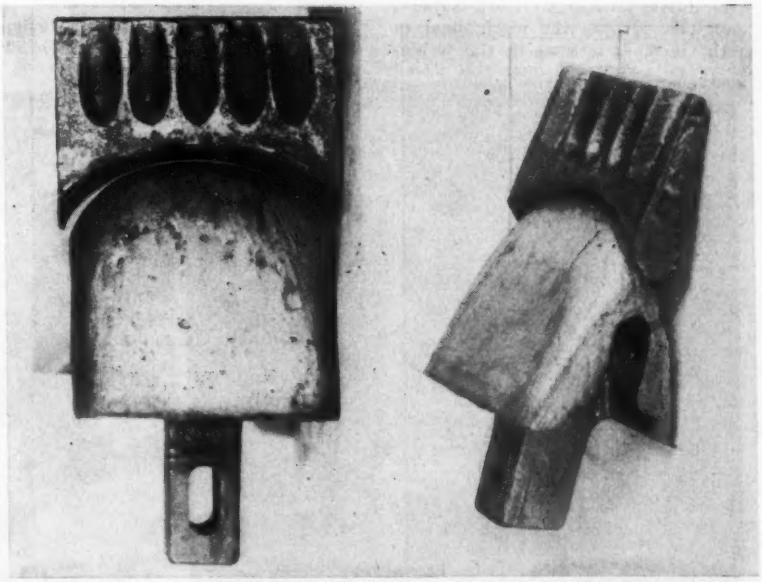
Large conveyor screws used in coal cleaning can also be hard faced. The flights are coated on one side by gas welding, using a composite tungsten carbide rod containing fine granules. This practice gave three times the wear life of previous experience, which used a less competent hard facing alloy.

Hard facing can be expected to pay whenever a serious wear problem cannot be dealt with by using parts of premium wear resistant alloys. As an example, power shovel dipper teeth, which can be made of Ni-Hard, (the 4.5 percent Ni, 1.5 percent Cr martensitic iron) give excellent service against mild scratching abrasion or erosion such as found in sand handling. However, transfer the machine to the gouging abrasion encountered in a limestone quarry and frequent fracture of the teeth from impact can be expected. The impact service will probably require austenitic manganese steel teeth, especially in very cold weather. The wear resistance is lower for this very tough alloy, but it can be improved by hard facing.

Some data on relative dipper tooth costs were recently published. Using new teeth, which were replaced when excessive wear developed, as a base line (about three sets were used during the test period), the cost of the same amount of digging was done at 53 percent of the cost if the worn teeth were resharpened by forging (three sharpenings were possible) and at 57 percent of the cost, if the worn teeth were reclaimed by welding and hard facing. The cost of welding a set of the worn teeth was only 27 percent of the cost of a new set, and there is no fixed limit to the number of times they can be reclaimed, as there is for forge resharpening.

The reclamation procedure used the technique shown in Fig. 1, and the performance was about the same as for new teeth. Fig. 2 illustrates a more common practice, wherein the repointer is of manganese steel like the base of the tooth. Life equal to that of a new tooth is also expected. However, neither of these is the best hard facing practice.

Conveyor screws protected against scratching abrasive wear by composite tungsten carbide weld deposits



A favorable wear pattern is the result of using cast manganese steel shoes with the groove design illustrated above. The outer grooves are filled with hard facing alloys. (Right) The shoe is then welded to the worn tooth, providing an effective replacement less expensive than the original, but which may outwear it several times

Look the Scrap Pile Over

The scrap pile makes a good starting point for the miner who wishes to investigate hard facing. Given either arc or gas welding equipment, a welder, suitable instructive literature and several hard facing alloys, it is not difficult to do simple jobs satisfactorily. A high-chromium iron, a martensitic iron and a martensitic steel are a good initial assortment of materials.

As welding skill is gained, it should be matched by better knowledge of the alloys and of base metals. An intelligent welder with mechanical aptitude will learn through experience some of the essentials of stress control during welding. Good supervision can provide the mechanical insight if it is lacking in the welder. An alert engineer teamed with one or more competent welders can soon save money for almost any mining operation.

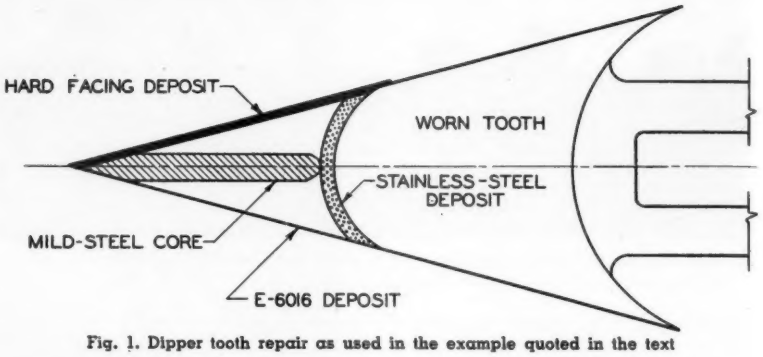


Fig. 1. Dipper tooth repair as used in the example quoted in the text

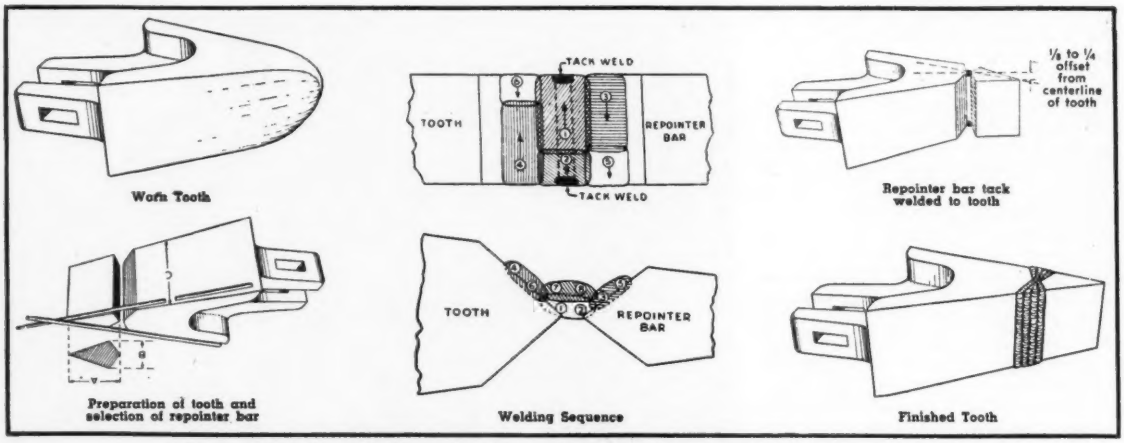
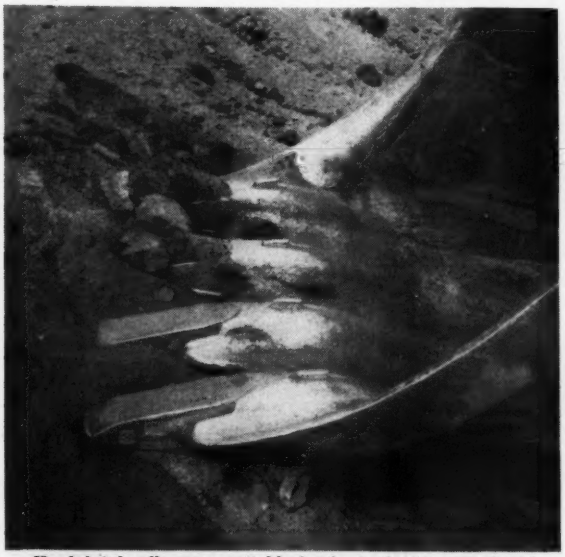
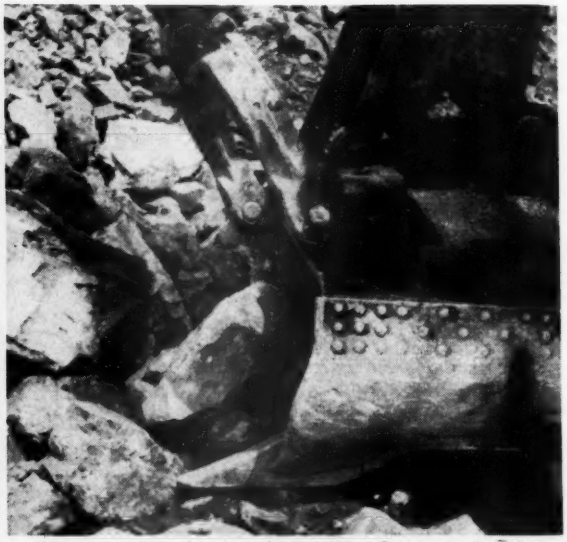


Fig. 2. Usual dipper tooth repair using cast repointer bars of austenitic manganese steel

Some of the best alloys for abrasion, like ABK*, Ni-Hard*, and HC-250* are brittle cast irons. They serve the mining industry well in the form of castings, but are vulnerable to breakage in service. Hardened alloy steels or austenitic manganese steel then replace them to provide toughness, but



Hard, brittle alloys are suitable for the teeth of power shovel dippers under conditions of erosion or low stress scratching abrasion



Where gouging abrasion characterizes dipper service, the associated impact demands very tough teeth (manganese steel) whose service life can be extended by hard facing

at a sacrifice in abrasion resistance. Hard facing may provide both qualities and, where appropriate, an average increase in performance of perhaps four to one is expected. Some rewards are many times this, while others are disappointing, chiefly because the alloy is not selected properly. Given a weldable base**, which is an important requirement, it is unusual that an air-hardening steel overlay cannot equal the original metal in wear resistance, and the cost of reclamation is seldom as high as that of a new part. Alloys of even better performance can repay their use, not only through less wear, but by reducing down-time for overhaul and replacement.

Choose Alloy Carefully

Most mining wear problems can be met with the group of wear resistant alloys in Table I. They are arranged in approximate order of abrasion resistance versus toughness, since some compromise between these properties is usually forced on the engineer.

Tungsten carbide is the most wear resistant. The deposit, because the molten steel dissolves both tungsten and carbon, is a hard alloy matrix (not mild steel as some suppose) containing the extremely hard granules of tungsten carbide. Their size, dis-

* Ni-Hard is the International Nickel Co.'s designation for a 4.5 percent Ni, 1.5 percent Cr cast iron; ABK is the American Brake Shoe Co.'s designation for their Ni-Hard type iron made with certain quality control procedures; and HC-250 is the Alloy Casting Institute's designation for a 26 percent Cr iron with a nominal 2.50 percent C content. These alloys are ordinarily used as castings, but the compositions can be used for hard facing also.

** This operates to exclude the brittle abrasion resistant alloys like white cast iron, Ni-Hard, and the like because they are extremely difficult to weld without cracking.

TABLE I—A GRADED SERIES OF WEAR RESISTANT ALLOYS

Increasing Abrasion Resistance ↑ / Increasing Toughness ↓ — Properties Sensitive to Carbon Content and Structure

1. Tungsten Carbide Composites	Maximum abrasion resistance Worn surfaces become rough
2. High Chromium Irons	Excellent erosion resistance Oxidation resistance
3. Martensitic Irons	Excellent abrasion resistance High compressive strength
4. Cobalt Base Alloys	Oxidation resistance Corrosion resistance Hot strength and creep resistance
5. Nickel Base Alloys	Corrosion resistance May have oxidation and creep resistance
6. Martensitic Steels	Good combinations of abrasion and impact resistance Good compressive strength
7. Pearlitic Steels	Inexpensive. Fair abrasion and impact resistance
8. Austenitic Steels Stainless Steels Manganese Steel	Work hardening Corrosion resistance Maximum toughness with fair abrasion resistance. Good metal to metal wear resistance under impact

TABLE II—HARD FACING ALLOY SELECTION FOR IMPACT SERVICE

Material:	Martensitic Irons*	Martensitic Steels*	Austenitic Manganese Steel
Suitable for:	Light Impact	Medium Impact	Heavy Impact
Yield Strength Tensils	60,000/80,000 psi	60,000/80,000	45,000/55,000
Ultimate Tensile Strength	65,000/90,000 psi	60,000/125,000	100,000/150,000
Tensile Elongation	0.01-0.04%	.01-0.10%	30-70%
Brinell Hardness	500-750	500-750	160-220
Rockwell Hardness	C48-C65	C48-C65	C0-C20
Yield Strength	150,000/	76,000/	45,000/55,000
Compressive 0.10% Set	285,000	175,000	
Ultimate Compressive Str.	265,000/385,000	180,000/385,000	200,000/310,000 psi
Elastic Deformation %	0.8-1.4	0.8-1.5	
Plastic Deformation %	0.2-5.4	1.0-22	30-55
Total Deformation %	1.2-6.5	1.8-23	
Wet Sand Abrasion Factor**	0.30-0.50	0.65-0.80	0.75-0.85
Dry Sand Erosion Factor**	0.05-0.15	0.15-0.55	0.55-1.00

* Untempered, corresponding to the usual status of weld deposits.
** Weight loss ratios compared with annealled SAE 1020 steel.

TABLE III—PROPERTIES OF SOME MARTENSITIC IRONS

	Chrome-Nickel Type			Chrome-Molybdenum Type			Chrome-Tungsten Type		
	Gas Welded	Small Castings*	Arc Welded	Gas Welded	Small Castings*	Arc Welded	Gas Welded	Small Castings*	Arc Welded
Type Composition	4.5% Ni		1.5% Cr	4% Cr		4% Mo	8% Cr		15% W
Resistance to Flow under Repeated Impact		Good			Good			Excellent	
Tensile Toughness		Low			Low			Low	
Resistance to Cracking under Repeated Impact		Low			Fair			Fair	
Oxidation Resistance		Low			Low			Medium	
Maximum Temperature considered advisable		1000°F.			1100°F.			1200°F.	
Creek Resistance		Low			Fair			Fair	
Rockwell Hardness**									
at 70°F	C60		C64	C63		C57	C62		C65
600°F	C51	C48		C51–54					
800°F	C51	C42		C52					
1000°F	C27	C17	C42	C46–43		C43	C50		C51
1200°F	C–13		C–8	C19–7		C4	C32		C27
Compression Strength									
0.10% set Yield—psi		180000			172–285000			184–226000	
Ultimate—psi		260–380000			310–386000			292–334000	
Elastic Deformation—%		0.9–1.6			1.2–1.4			0.9–1.0	
Plastic Deformation—%		0.6–3.0			0.3–1.4			0.3–0.5	
Abrasion Resistance	Good	Good	Fair	Excellent	Excellent	Good	Excellent		Good
Wet Sand Abrasion Factor	0.37/0.57	0.30/0.65	0.60/0.74	0.30/0.46	0.34/0.47	0.38/0.54	0.28/0.50		0.40/0.60
Erosion Resistance	Good		Fair	Excellent		Good	Excellent		Good
Tensile Strength—psi	22000–43000								
Elongation —%	0.001–0.050								
Brinnell Hardness	500–650								

* Properties considered between those of gas and electric weld deposits. Used for some test specimens to eliminate welding variables and defects.
** Instantaneous values.

tribution and quantity are subject to specification, welding method, and welding skill. The overlay tends to become rough from differential wear, which may be an asset in certain rock cutting operations. The cutting points of most oil well rotary rock drill bits are surfaced with granular tungsten carbide. Where a very smooth worn surface is wanted, the following irons are better.

The high chromium irons (with about 25 per cent or more of chromium) are less than half as expensive as the tungsten carbide welding rods, but are less abrasion resistant. They resist oxidation better, (they are good heat resistant alloys) and perform best under low stress sliding or scratching abrasion. They polish well under such conditions, producing a smooth, low-friction face. Flotation mill impellers, pump runners, classifier parts and the like are good applications for the chromium irons. The commonest hard facing representative has an austenitic matrix and has a nominal composition of 5 percent carbon, 6 percent Mn, 2 percent Si and 28 percent Cr. Another grade, HC-250, has 2.50 percent carbon with less manganese and silicon. This is popular for castings as well, as it can be softened to about 350 Brinell hardness, machined and rehardened.

The austenitic chromium iron is not well adapted to impact service since it flows readily and then cracks. It is also mediocre for grinding abrasion, which imposes high stress on a microscopic scale.

Wear Differs

Judgment is required in analyzing abrasive wear because of its complexity. We can recognize at least three types that are enough different to modify alloy selection. They can be simply described as erosion or low-stress scratching abrasion, grinding or high stress abrasion, and gouging abrasion. The last is akin to machining. While chromium-irons are excellent for withstanding erosion, the martensitic irons, costing about the same, are much better for high stress abrasion, as typified by ball mill service. The wear in ball mills is usually taken by castings, but the essential conditions may occur in many other places. A sandwich of metal, with abrasive between, plus enough stress to crush the abrasive is a signal of grinding abrasion.

Martensitic irons consist of a hard carbide matrix with islands and areas of martensite — the constituent of hardened tool steel. They are brittle, but otherwise have an admirable combination of high compressive strength, good resistance to low and high stress abrasion, and favorable welding behavior. Those for hard facing air harden from the welding heat and need no special heat treatment. Chromium and nickel (Ni-Hard), chromium and tungsten, or chromium and molybdenum are the usual alloys that confer the hardening power. The Cr-Mo type is probably the best for all around hard facing, but it must be carefully balanced metallurgically for optimum results.

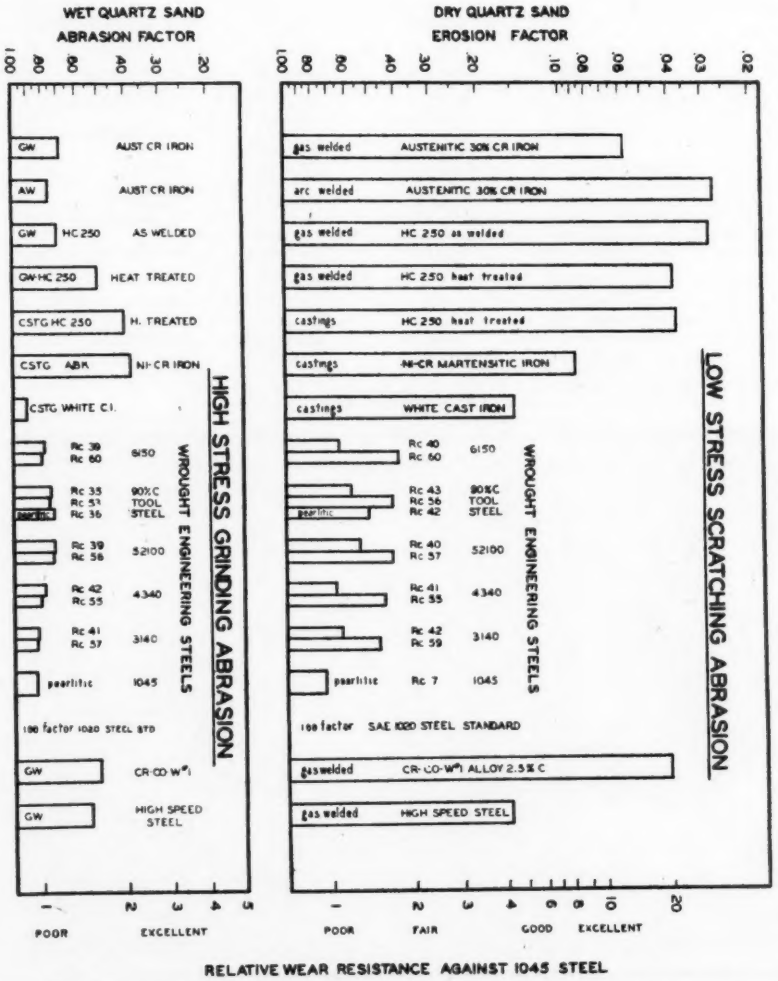


Fig. 3. Comparative resistance of various hard facing and engineering alloys to low and high stress abrasion

Forget Certain Alloys

Cobalt base alloys have been much used for hard facings, but in mining they should be replaced by others. Their distinctive property is hot hardness and unless the service temperature is above 1200° F their cost and their use of scarce metals is seldom justified. Nickel-base alloys have a similar status; unless unique corrosion resistance is required there are less expensive materials for wear resistance.

Martensitic steels represent another step from abrasion resistance toward toughness. High alloy content makes them air harden without a furnace treatment. They can be used to improvise tool tips as well as for surface protection, and they are popular where medium impact is involved.

Pearlitic steels, which have medium carbon and little or no alloy content, are useful to build up worn areas before hard facing. They are not usually recommended as an overlay, though frequently they are appropriate as a base. A simple 0.40 percent carbon steel is an excellent foundation for hard facing.

As the need for toughness increases the final choice is austenitic manganese steel. It is generally employed in the form of castings, and welding is used to rebuild worn areas. This should be done carefully as the toughness can be destroyed by careless heating. Sometimes manganese welding electrodes are used for a protective overlay, but generally a martensitic or austenitic iron is better. Aus-

tenitic stainless steels are theoretically interchangeable with manganese steel, but because of their greater cost they are usually justified as surfacing only where their corrosion resistance is needed.

Where railway track work is an important part of mining, as in large open-pit operations, the rebuilding of worn down and battered frogs and crossings is done with austenitic manganese steel electrodes. This represents service with heavy impact and little abrasion.

To facilitate the choice of alloys where abrasion and impact are involved, Tables II and III have been prepared. Erosion and grinding abrasion resistance are charted together in Fig. 3, and the compression properties, important where impact or metal to metal wear occur, appear in Fig. 4.

The third step, proper welding, can best be dealt with by supervision, since it is largely a matter of acquired skill rather than engineering knowledge. Many hints appear in published form, but actual experience is necessary. Fortunately, even a green man can produce acceptable hard overlays within a short time, though the more exacting jobs, such as track work rebuilding, require considerable skill.

Much added information can be obtained from the following papers: "Composite Tungsten Carbide Weld Deposits," *The Welding Journal*, February, 1951; "Hard Facing for Impact," *The Welding Journal*, Febraury, 1952; and "Hard Facing Alloys of the Chromium Carbide Type," *The Welding Journal*, October, 1952.

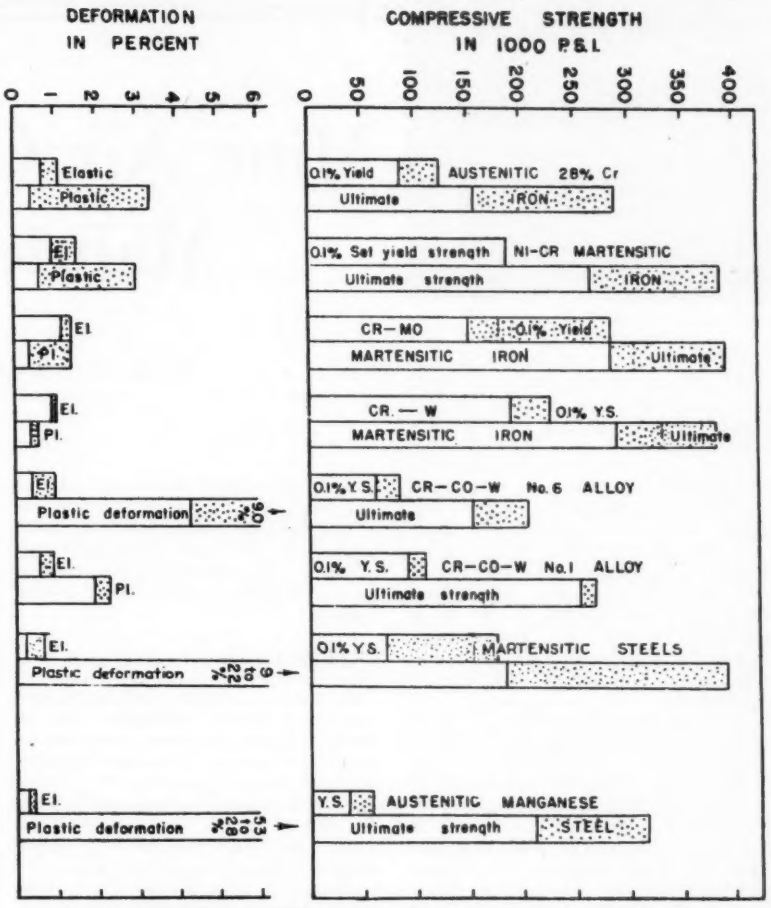


Fig. 4. Comparative compression properties of various hard surfacing alloys

Blasthole Drilling

(*Continued from page 80*)

round for use with the 2⅛-in. carbide insert bit in the Boyd type ore. It will be noted that a center subdrift has been added to improve the hole spacing in the center area of the slice round. Also the drift spacing has been changed so that the length of holes will conform to the carbide bit "change out" previously mentioned, namely, 60 ft of hole drilled. From a study of the slice round it is found that the tons per ft of hole drilled is 4.56 while the pounds of explosives per ton is 0.224. It is felt that the better hole spacing and the increase of explosives, even with a six-ft burden between slice rounds, will give better fragmentation and a lower over-all cost per ton of ore mined.

Blast hole test drilling was confined to the relatively soft Boyd type ores. Test drilling is now being conducted in the siliceous type ores of the Burra Mine; the results are not yet conclusive.

From data so far available the following is evident, namely: that in Burra the carbide bit "change out" is around 25 to 30 ft; that the ft drilled per bit is about 80; and that the apparent cost per ft is $0.684 as against $1.089 for the diamond drill.

Study of the results of the test drilling in both the Boyd and Burra Mines shows that there is a place in the blast hole drilling program for the 2⅛-in. carbide insert bit where the diamond bit penetration is 75 ft or less per use, where excessive length of hole is not required and where a two-man crew is necessary because of the working place being remote from other crews. It is also apparent to us that it is safer to operate a deep hole percussion drill than it is to operate a high speed diamond drill. This high rotating speed of the feed screw is a hazard for the operator.

In conclusion, acknowledgments are in order to all those who aided in the gathering of information and data. Also, appreciation is extended to the management of the Tennessee Copper Co. for permission to publish this article.

TIME STUDY OF TEST DRILLING

Feet Drilled	2,217
Feet per Minute, Average (While Drilling)	0.71
To Change Rods	45 Sec
To Collar Hole With Steel Bit	1 Min 40 Sec
To Drill Hole and Set Casing (On Down Holes)	3 Min
To Set Dip on Machine	1 Min 30 Sec
Rod Pulling, Change Bit and Go Back in Hole	1.62 ft per min
Rod Pulling (Long Holes)	2.13 ft per min
Average Blowing and Washing Time (Holes 55 to 90 ft deep)	12 Min

Operators Corner

Mine Air Compressor Maintenance

By the Service Department Staff
Joy Manufacturing Co.

THE air compressor, long of primary importance in metal mining, has recently assumed a new role in this country's coal fields. With the advent of roof bolting and the increased application of other air operated equipment, thousands of experienced mine maintenance people are faced with the responsibility of caring for a type of equipment with which they are, for the most part, totally unfamiliar; a machine which cannot be expected to give top performance under the maintenance program applied to other classes of underground equipment.

It is the purpose of this article to point out a few of the more critical considerations in air compressor maintenance. Many of these apply in varying degree to all compressors, regardless of application. It is safe to say that almost any condition unfavorable to air compressor operation and maintenance reaches its maximum in the mines.

The machines used to supply air to the mines are of many types. Main air sources are usually large multicylinder water-cooled compressors permanently located on the surface, or in the underground shop. Smaller air or water cooled units mounted on skids, track, or rubber tires, are the most common air source on the individual working section. Still a third type of unit with which the maintenance man must contend is the small auxiliary compressor used for light duty, such as inflating tires on mobile equipment.

Compressor Types Vary

Compressors in mine use vary as widely in construction and in maintenance requirements as they do in application. Each plays a vital role in the modern mine, and must be kept operating shift after shift if the mining cycle is to proceed uninterrupted. If the compressor maintenance program is to be a success, each type must be considered separately and a separate routine established for its care.

We will concentrate here on the portable "Minecar" type of compressor. Use of this type has increased greatly since roof bolting has come to the fore, and it is primarily because of the minecar compressor that mine mechanics have been faced with the necessity of expanding their skills to include the fine points of compressor upkeep.

Dirt Is Greatest Enemy

As is the case with all types of underground mining equipment, one of the most important tasks in the maintenance of the air compressor is the ceaseless battle against dirt. Dust and other foreign material settling on the outside of the machine obscures many otherwise obvious mechanical defects, such as loose bolts and connections. It also blocks intercoolers and radiators and blankets the entire unit, interfering with the cooling of both the air under compression and the drive and compressor units themselves. Dirt further works into the lubricating system and mechanical parts of the unit, restricting oil circulation and accelerating wear on the gears, bearings, cylinder walls, and piston rings. Dirt in the intake air fouls valves, and since much of the foreign material in mine air is abrasive, dirt entering the cylinders mixes with the lubricating oil and acts as a lapping compound, causing rapid wear on piston rings and cylinder walls.

First step in the fight against dirt is periodic scheduled cleaning of the compressor exterior. The man assigned to this task is in a good position to observe many potential sources of trouble and correct them before any damage is done. In addition, five minutes at the end of each shift should be devoted to blowing dust from cylinders and drive motors and blowing out intercooler core sections. At the same time any stray oil or grease should be wiped off. These materials are as effective as fly paper in trapping dirt and dust and quickly build up a gummy blanket which may obstruct the mechanism or cause dangerous overheating.

Probably the most important antidirt precaution is maintenance of the intake air filter. Few mechanics would think of running their automobiles with the air filter removed, and in the atmosphere of a mine it is doubly important that the filter be in place. Surface compressors may have clean intake air piped in from outside the building. This, of course, is not possible in the case of underground units, so every effort must be made to remove foreign material from the air before it reaches the valves and cylinders. Filters must be kept open and clean, capable of removing dirt from the air without causing undue resistance to the passage of air. Although operating conditions vary widely, once per shift is none too often for air filter cleaning. Most mine compressor filters are of the oil bath type. Cleaning should consist of draining, cleaning, and refilling the filter bowl and cleaning the filter element. In cleaning the element care must be exercised not to use any fluid which is inflammable when compressed.

Treat As Precision Machine

As stated earlier, there is little that can be done to provide the underground compressor with dust free air. However, it may prove possible and very advantageous to locate the compressor on intake air side of the pneumatic equipment it powers. It is particularly important that the underground compressor be moved out of a section in a coal mine when rock dusting is to be done, and that it not be operated when there is rock dust in the air. The compressor operator, maintenance man, and section foreman should be on the lookout for special conditions such as this which may cause undue damage. They must remember that the air compressor is a piece of precision machinery and deserves to be treated as such.

Air compressor lubrication schedules are strongly influenced by the amount and character of dirt present in the air. Compressors operated in a clean factory or laboratory may be safely run for a relative time between changes of lubricating oil. Oil and oil filters should be changed much more frequently in a mine compressor. Otherwise the filter may plug, and all additional dirt will continue to circulate with the oil, or oil flow will be blocked and the bearings starved.

Change Oil Often

When discussing oil changes, it is well to mention that the dirt introduced into the crankcases of other mining machines gets there by falling on, or against, some moving part, and then being carried through a seal or gasket by that part. A compressor, on the other hand, goes out of its way to attract dirt and dust from the surrounding air. In addition to oil pollution in the manner mentioned above, compressor oil is contaminated with solid material pulled through the air filter, into the cylinders and carried to the crankcase by the lubricating oil. For this reason, air compressor oil should be changed more frequently than transmission oil in other underground mining equipment. This fact is too often overlooked by maintenance men.

Equally as important as oil changes is the grade of oil used in a compressor. Everyone recognizes the inconvenience of maintaining a supply of several different kinds of lubricant on the working section, but, unless an adequate lubricant is selected and made readily available, the compressor operator will invariably add hydraulic oil, transmission oil, or whatever is on hand rather than shut down. The available oil may be satisfactory, but all too often the result of such action is the formation of carbon deposits which stick or break valves.

It is suggested that the compressor lubrication problem be called to the attention of one of the many reputable oil company representatives who call on all mines. In many cases these lubrication specialists can recommend a product which will serve as a compressor lubricant, and also be used as a hydraulic oil, or for other applications on the working section.

Watch Condensation

When two-stage compressors are operated in the humid atmosphere of a mine, particular attention must be given to the dangers of condensation in the intercooler. As the partially compressed air is cooled at this point some of the water vapor it contains is liquified. Unless this water is removed from the intercooler, it will be carried to the high pressure cylinder, where it washes the lubrication off the cylinder wall. This, of course, greatly increases wear on both cylinder liners and piston rings.

To combat this, intercoolers are provided with drain valves and in some cases automatic condensate traps. If they are to do the job intended, such drains and traps must be opened frequently to drain off the water. When excessive high pressure cylinder wear is encountered on machines equipped with simple drain cocks, the installation of automatic traps should be considered.

Read the Gages

Many compressor ills may be recognized and corrected before trouble results by simply paying proper attention to the instruments and gages provided. Two-stage units are equipped with compressor oil pressure gage, intercooler pressure gage, terminal pressure gage, and crankcase oil dip stick. As an example of the story told by these instruments, one instruction manual lists the following as possible causes of a low intercooler pressure reading:

(1) Dirty air filter
(2) Improper operation of low pressure cylinder intake or discharge valves
(3) Defective unloading plungers, or valves, in the low pressure cylinder
(4) A leak in the intercooler
(5) Intercooler blow down valve stuck
(6) Any other malfunction that decreases the efficiency of the low pressure cylinder
(7) Defective pressure gage

On the individual section underground, compressors are generally used for roof bolting or the operation of rock drills. It is common practice to use the top of the machine for storage of drill steel, roof bolts, plates, roof jacks, and wedges. This makes it almost impossible to clean the compressor, check the oil, change oil filters, or do any similar work without first unloading hundreds of pounds of equipment. The natural result is that maintenance work is left undone. Many mines have solved this problem by building racks or carriers to hold the supplies. Each mine has its own ideas of how racks should be constructed to suit their individual needs, but all such efforts bring about the same results, improved compressor maintenance.

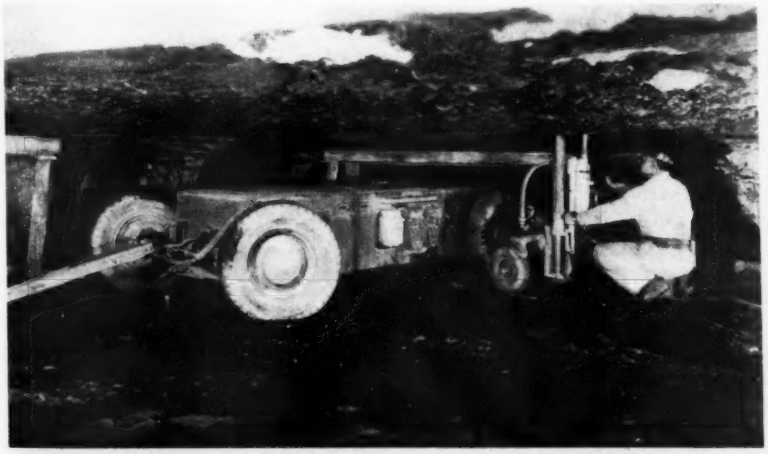
Learn Your Compressor

The forgoing are but a few of the many important considerations of which all mine personnel concerned with the operation of air compressors should be aware. The mine foreman, section foreman, compressor operator, repairman and supply clerk should avail himself of every opportunity to increase his knowledge of this all-important piece of equipment. Fortunately, very complete instruction manuals and parts lists are provided with most mine compressors and manufacturer's representatives may be called upon to answer questions not covered by these publications.

When a machine as complex as the air compressor is introduced into a mine, it should be accompanied by a thorough maintenance training program. Wherever possible this should be done before the compressor is put into service. If training is deferred for several weeks or months it becomes necessary not only to train men in proper practices, but also to break the incorrect procedures and misconceptions which always spring up where personal theories and guesswork are allowed to take the place of facts.

The first step in most compressor maintenance programs should be to

(*Continued on page* 136)



Do not allow tools and equipment to accumulate on the compressor

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Wheels of GOVERNMENT

AMC

As Viewed by HARRY L. MOFFETT of the American Mining Congress

REALIZING that the state of the nation's defenses and its economic security depend in no small degree upon the continued health of the domestic mining industry the new Administration is casting a more than casual glance at the problems besetting that industry, and careful attention is being given to the views expressed by its representatives, both before Congressional committees and the host of Government departments and agencies.

The plight of the nation's lead and zinc industries, its strategic metals industries, and its coal industry are becoming more and more a topic of discussion among both legislators and administrators.

On Capitol Hill, attention is being given to recommendations for revision of the Taft-Hartley Act to rid important segments of the mining industry of Communistic influences in labor unions and to provide a better climate for labor negotiations. In addition, the nation's lawmakers are undertaking studies of the problems facing the industry from the standpoint of taxation, tariff, public lands administration, and encouragement of the small miner.

An increasing number of experienced mining men are turning up both in the executive branch and on Capitol Hill. The Interior Department, for the first time in many years, has an assistant secretary with a real mining background heading up its metals and minerals activities. Felix E. Wormser, long associated with mining activities throughout the country, has been named to that post and is directing his efforts to solving some of the most pressing problems confronting the industry. The staffs of the powerful Interior and Insular Affairs Committees of both the House and the Senate have likewise been strengthened with the addition of well-qualified mining men. George Holderer and Robert Butler, both formerly with the Defense Materials Procurement Agency, have been appointed to the staffs of the Senate and House Interior Committees, respectively.

During the past few weeks Congressmen and Senators have met frequently with mining industry leaders and have been thoroughly posted on the major threats to its maintenance in a sound and healthy state.

The sum total of these events points to far more sympathetic consideration of the industry's needs than has existed in the past two decades.

Fiscal-Tax Outlook Clouded

The Administration is proceeding with caution as to any promise of early tax reduction, pending a determination of how much money will be needed to run the Government for the next fiscal year and what receipts can be expected. President Eisenhower has strongly emphasized his opposition to any tax reduction until a balanced budget is in sight.

Leaders in the House and Senate likewise adhere to this view. They are pinning their hopes for tax reduction on substantial slashes in the Federal budget and are awaiting the results of current hearings being held by the various appropriations subcommittees. In addition, they have called upon Budget Director Dodge to prune down the budget requests of the Executive Branch by eliminating "water" in such requests wherever possible, and by postponing Government-sponsored public works and the like where the urgency is not immediate.

House Ways and Means Committee Chairman Dan Reed (Rep., N. Y.) continues his demand for prompt passage of his measure to cut personal income taxes by about 5½ percent in the present year and 11 percent in 1954. However, the Rules Committee has refused to give the measure right of way on the House floor, and Reed has abandoned a plan to force a floor fight on the bill because of the fact that it would probably be so saddled with amendments as to bar its passage.

★ ★ ★ ★ ★ ★ ★

Washington Highlights

FISCAL SITUATION: To determine tax cuts.

TAFT-HARTLEY ACT: Mining industry urges strengthening.

CONTROLS: Standby or none?

SEAWAY: Outlook cloudy.

SMALL MINES: Western hearings slated.

TARIFF: Mines seek protection.

★ ★ ★ ★ ★ ★ ★

T-H Hearings Roll On

Both the House and Senate Labor Committees continue hearings on possible revisions of the Taft-Hartley Act. Despite previous statements of labor leaders that unions should not seek sweeping revision of the labor law, union officials, particularly of the CIO and AFL, have called upon the Committees to adopt far-reaching amendments to the law which, in effect, would nullify it and return to the days of the Wagner Act.

Increasing attention by members of both committees is being centered upon proposals to enlarge the NLRB, to broaden the Act to eliminate Communistic influence from labor unions, to expedite cases before the NLRB, to strengthen the present provisions on "feather-bedding", and to shore up its national emergency provisions.

The mining industry has had its day in court before both committees and the testimony of its witnesses was of keen interest to both Senators and Congressmen, many of whom complimented them for the fine exposition of the industry's views.

Charles R. Kuzell, mining engineer of Douglas, Ariz., and Denison Kitchel, attorney of Phoenix, Ariz., represented the American Mining Congress before both committees. They called for the

adoption of ten changes which would strengthen the Act to provide security for the rights of individuals and protection of the public interest in labor-management relations.

They urged amending the law to accomplish the following: (1) prohibit compulsory unionism in any form; (2) prohibit labor monopolies and industry-wide bargaining; (3) uproot Communistic influences from the internal affairs of unions; (4) require the President, in threatened national emergency or lockout situations, to utilize the provisions of the Act; (5) prevent industrial sabotage; (6) safeguard the functions of management and the rights of workers from union encroachment; (7) outlaw mass picketing, violence, intimidation and similar terroristic devices in labor disputes; (8) require that NLRB decisions be based upon the preponderance of evidence; (9) restore stability to labor agreements; and (10) create a Department of Employer-Employe Relations in lieu of the present Labor Department.

These spokesmen told the committees that compulsory unionism is a major issue facing the nation today and that if it is not curbed a steady march down the road to a labor dictatorship and ensuing state socialism will be the ultimate result. They made it quite clear that there is a need for strong, democratic unions and that there should be no impingement upon the right of workers to strike under lawful circumstances for lawful objectives.

Also during the hearings before the House Labor Committee, Miles P. Romney, secretary-manager of the Utah Mining Association, urged that Congress write into the law a provision to ensure stability and equal responsibility in labor agreements. Richard C. Berresford, of the New Jersey Zinc Co., pointed up his company's experience with the tactics of the Mine, Mill and Smelter Workers Union during a 15 months' strike at its Hanover, N. M., property, during which complete disregard was evidenced by the union leadership for the orderly processes of law. He urged legislation be adopted to rid unions of Communist influence. Rufus Poole, Washington, D. C., attorney, also called for protection of labor against Communist control.

Both committees will await the completion of extensive hearings before settling down to the drafting of amendments to the law.

Also on the labor front, the tripartite committee appointed to advise the Secretary of Labor upon suggested changes in the Taft-Hartley Act met but twice before agreeing to disagree. Industry members refused to go along with a proposal that a majority vote of the labor, public and industry members set the policy on all suggested changes in the law. They carefully pointed out that such action would only result in negotiation with labor representatives, with the public members acting as arbitrators, of a set of recommendations on the Act. They rightfully stated that legislation should be formulated by the legislators who represent all the people "rather than by a small unrepresentative group."

Standby Economic Controls?

The Senate Banking Committee continues to delve into the question as to whether Congress should enact standby economic controls over prices, wages and rents. Industry witnesses appearing before the group have almost unanimously voiced the opinion that such controls should be removed from the statute books and that if an emergency should arise, Congress should then determine the nature and extent of needed controls.

Chairman Capehart (Rep., Ind.) is pressing for a measure which would give the President power to invoke a 90-day wage-price freeze in an emergency.

Administration sources have indicated that they would not be averse to having some form of standby controls on the books which could be invoked by the Chief Executive should the nation get into an armed conflict or the national security be seriously threatened.

Meanwhile, the Office of Price Stabilization has removed the last vestige of its former sprawling ceiling price blanket, and the country has reverted to a free market price-wise.

On the materials front, limited controls over scarce materials still may be the order of the day. Plans are afoot for the installation of a small-scale CMP system to provide a flow of needed materials to meet defense requirements. The plan would give a priority on scarce materials to contractors manufacturing supplies for the armed forces.

Block Land Bureau Transfer

Well-founded rumors that the Administration was considering the transfer of the Bureau of Land Management from the Department of Interior to the Department of Agriculture as a part of the reorganization plan for the latter department brought forth a storm of protest from mining and other natural resource industries early in March. Taking the lead in opposing such a move, the American Mining Congress joined with other land users in voicing their opinion as to the serious effects of such a transfer.

The Conference of Western Senators, headed by Senator Pat McCarran of Nevada, after hearing from the natural resource industry representatives, protested the transfer in letters to the President.

Following these protests, it was announced that the Administration would make no change in the status of the Bureau of Land Management and that it would remain in the Interior Department.

Seaway Up Again

The controversial St. Lawrence seaway and power project is again the subject of debate before Congress. The Senate Foreign Relations Committee has under study, after brief hearings, a measure to authorize the United States to join with Canada in the development of both the seaway and the power project.

Opponents of the proposals are sponsoring measures to bring about a joint study and investigation by the U. S. Army Engineers and the Interstate Commerce Commission, to determine the financial soundness, engineering practicability, and economic effect of the project upon all parts of the United States.

Whether or not the seaway will finally receive its authorization in this Congress remains in doubt, but there is a stronger prospect for action than at any time since it was first proposed many years ago.

Another measure dealing with waterways, and in a like controversial stage—the question of jurisdiction over the submerged coastal lands—bids fair to become law in some form this year. Most observers believe that Congress will give the States title to the submerged coastal lands out to the legal limits off their respective shores, but with the United States retaining title to the lands lying beneath the Continental Shelf and beyond the historic State boundaries. All measures covering the tidelands problem contain a provision that will not impinge upon existing mineral rights under unmeandered streams.

Mine Hearings Scheduled

Rep. William ("Bill") Hill (Rep., Colo.), Chairman of the House Small Business Committee, has scheduled hearings of his committee in Denver, San Francisco, Spokane and Phoenix in late April to obtain the views of the mining industry on the many problems it is facing. Particular attention will be given to the economic plight of small mines and strategic mineral producers. All of the hearings will be open to receive testimony from any individual in the industry who cares to set forth his views as to the industry's needs at this time. Representatives of the American Mining Congress have been working closely with Rep. Hill and the committee staff in an effort to bring out fully the major questions troubling the industry. These include tax and tariff treatment, public lands administration, mine financing, stockpiling, and a host of others.

The Small Business Committee will report its findings to Congress after

(*Continued on page* 123)

AMC Personals

The name of **Felix E. Wormser** has been sent to the Senate for confirmation as Assistant Secretary of the Interior, for mineral resources. He is the first man from the mining industry to be appointed to the post, which was established December 1, 1950.

Wormser is a graduate of the School of Mines, Columbia University. His first mining experience was gained as a mining engineer in Oregon. He served on the editorial staff of *Engineering and Mining Journal* from 1920 until 1925, when he left to become a consulting mining engineer. In 1928 he was named secretary-treasurer of Lead Industries Association and in 1947 went with St. Joseph Lead Co. as assistant to the president. He was later made vice-president of that company.

Paul W. Beda, vice-president, purchases, Old Ben Coal Corp., retired after 48 years with Old Ben and predecessor companies. **Gordon Buchanan, Jr.,** was appointed purchasing agent, succeeding Beda. Buchanan has worked for Old Ben since 1922.

The board of directors of American Smelting & Refining Co. has announced the election to the board of **Simon D. Strauss.** Strauss has been with the company since 1945. He was made sales manager in 1947, and was elected a vice-president in 1949.

Ray Callahan has been named assistant general superintendent of mines for the Johnstown Coal & Coke Co. He formerly served as special assistant to the vice-president of Pennsylvania Coal & Coke Corp.

Merton I. Signer was advanced to the position of geologist for the International Minerals & Chemical Corp. at Carlsbad. At the same time it was announced that **E. C. Skinner** has joined the company at Carlsbad as industrial engineer. Skinner has had wide experience in coal mining and administration during the past 18 years. He worked in various capacities for the Pittsburgh Coal Co. and recently has been assistant to the general superintendent of the Ford Collieries.

N. T. Camicia has been promoted from manager of the West Virginia division of the Pond Creek Pocahontas Co. to general manager of that company. He was succeeded as division manager by **Joseph Skiba,** superintendent of the Rockhouse division of Island Creek Coal Co. **L. G. Barber** has succeeded Skiba.

Russel B. Caples, manager of Anaconda Copper Mining Co.'s Great Falls, Mont., reduction department since 1941, has been elected president and director of Anaconda Aluminum Co. He succeeds **Francis O. Case** who recently resigned to become president of the Glen Alden Coal Co. As president of Anaconda Aluminum Co., Caples will make his headquarters in New York City. However, he will continue to manage the zinc contract negotiations for the Montana zinc plants of Anaconda Copper Mining Co.

Alton Gabriel, technologist and administrator with the U. S. Bureau of Mines for more than 20 years, has been named acting regional director of the Bureau's Region VII, the southeast. Dr. Gabriel replaces former regional director Hewitt Wilson, who died recently.

Dwight H. Plackard has resigned as executive secretary of the New Mexico Mining Association to accept position as editor of *The Metro News,* a new weekly newspaper in Albuquerque, N. Mex.

W. R. Graham has been elected vice-president of the Pocahontas Land Corp. according to a recent announcement. He succeeds the late Thomas H. Clagett. **J. M. B. Lewis, Jr.,** has been made assistant general counsel for the corporation.

R. Livingston Ireland has been elected a director of the Phelps Dodge Corp. to fill the vacancy created by the resignation of George M. Humphrey, now Secretary of the Treasury. Ireland is chairman of the executive committee of the Pittsburgh Consolidation Coal Co. and of the M. A. Hanna Co.

Joseph G. Feeney, recently appointed eastern vice-president of Republic Coal and Coke Co., was elected to succeed the late Carroll B. Huntress as chairman of the National St. Lawrence Project Conference.

Election of **Bert O. Brand** as a director of Vanadium Corp. of America was announced by William C. Keeley, president. Brand, vice-president and secretary, has been associated with the company for the past 11 years.

E. I. McGee retired from his position as assistant mechanical engineer with the U. S. Steel Corp. at Uniontown, Pa., in mid-February. He reached retirement age at that time.

Paul B. Jessup has been appointed assistant treasurer of Kennecott Copper Corp. A native of Bellingham, Wash., Jessup was graduated from the University of Washington in 1930 and the law school of that University in 1933. He practiced law for three years in Seattle before entering the employ of the Day interests whose mining operations were consolidated into Day Mines, Inc. in 1947. He has resigned his position as vice-president of Day Mines, Inc. at Wallace, Idaho, to assume his duties at Kennecott's executive offices in New York City.

J. Marshall Stecker, president of the First National Bank of Mt. Carmel, Pa., was recently elected to the board of directors of the Philadelphia and Reading Coal and Iron Co.

The St. Joseph Lead Co. announced that **Harry E. Outcault,** manager of zinc oxide sales, exercised the early retirement privilege under the company's retirement plan for salaried employes. **Charles R. Ince,** vice-president and manager of metal sales, becomes vice-president and sales manager of the company.

W. M. Ritter, vice-president and general manager of Red Jacket Coal Corp., was recently made president of that company. He succeeds **Paul D. Ritter,** who retired. The new president has held the positions of division superintendent, assistant general manager, and general superintendent successively until his appointment to vice-president and general manager, in April, 1951.

Otto Herres, vice-president of the Combined Metals Reduction Co., has been elected vice-chairman of the Mining Standards Board of the American Standards Association representing the metals groups, the ASA recently announced.

Continuing in office are **M. D. Cooper,** director of the National Coal Association, chairman; and **H. H. Otto,** Hudson Coal Co., vice-chairman representing the coal groups.

Arthur Metcalfe, roof bolt specialist for the U. S. Bureau of Mines, has resigned that position to join the sales and service staff of Pattin Manufacturing Co. Metcalfe had been with the Bureau for more than ten years and had pioneered roof bolting in the northern West Virginia coal fields.

Following the retirement of **F. S. Follansbee,** chief engineer of the Pittsburgh Coal Co. Division of Pittsburgh Consolidation Coal Co., the responsibilities of the department were allocated between **V. D. Hanson,** chief mechanical engineer, and **C. M. Hays,** chief mining engineer. Hays will be primarily concerned with the mine mapping, planning and general supervision of coal and surface holdings. Hanson's duties will be in the fields of design and erection of structures, mechanical installations, preparation plants and underground mechanization.

Climax Molybdenum Co. of Michigan has elected **George A. Timmons** as vice-president and a director.

Indiana Governor George Craig has appointed **Charles A. Purcell** to succeed William Butts as director of the Indiana Bureau of Mines and Mining. Purcell has been associated with the Viking Coal Corp. for the past four years. **John J. Jones** has been appointed superintendent of the Mine Rescue Station, succeeding J. McCullough.

The appointment of **Ira K. Hearn, Jr.,** as industrial engineer, Western Mining Divisions, Kennecott Copper Corp., was announced by J. P. Caulfield, general manager.

Hearn's headquarters will be in Salt Lake City. From there he will work with the managements of the four mining divisions in Utah, New Mexico, Arizona and Nevada. Before assignment to his new post, Hearn was assistant to the president of Kennecott in New York.

— Obituaries —

On February 16 the coal industry lost one of its great men. **Howard N. Eavenson,** who would have been 80 years old on July 15, died at his home in Pittsburgh, Pa.

Mr. Eavenson's career included accomplishments as engineer, consultant, author and practically every other phase of operations in the coal industry. In 1897 he joined the H. C. Frick Coke Co. at Uniontown, Pa., as division engineer. By 1902 he was made chief engineer of the U. S. Coal & Coke Co. division of U. S. Steel at Gary, W. Va., and was in charge of the steel company's development at Lynch, Ky. In 1920, he resigned to head the consulting firm, now known as Eavenson & Auchmuty, and had continued in this position until his death. In addition to these positions, he was formerly president of the Clover Splint Coal Co. and for some years had been a co-receiver of the Elk Horn Coal Corp. He was also a director of the Boone County Coal Corp. and a trustee of the Carnegie Institute of Technology.

Mr. Eavenson was the author of three well-known books on coal: "Coal Through the Ages"; "Pittsburgh Coal Bed—Early History and Development"; and perhaps his most famous one, "First Century and a Quarter of American Coal Industry."

He was the first president of Bituminous Coal Research, Inc., serving from its organization in 1933 until his resignation in 1948. He had always been one of the industry's leaders in the advocacy of scientific research as the most effective means of making coal more valuable to the nation.

Stan L. Jerman, 57, well known Utah mine operator and leaser, died February 18 at his home in Eureka, following a lingering illness.

Nels Anderson, president of the Alloy Steel & Metals Co., died February 6 of a heart attack in Los Angeles, Calif. Mr. Anderson was official representative of his company on the Manufacturers Division of the American Mining Congress.

John R. Atherton, 81, treasurer of the Hudson Coal Co. since December, 1946, and affiliated with that company and its predecessors for the past 65 years, died February 3. Mr. Atherton started to work for the Delaware & Hudson Canal Co. as a clerk in 1888. He was named assistant paymaster for the company in 1895. In 1918 he became paymaster and assistant to the treasurer. He was named assistant to the treasurer of the Delaware & Hudson Railroad Corp. in 1925, and in 1935, assistant treasurer of the Hudson Coal Co., holding that position until 1946, when he became treasurer.

Harry S. Gay, 64, vice-president and general manager of the Gay Coal and Coke Co., died March 4. Mr. Gay was widely known as an inventor and developer of coal mining machinery. He was among the pioneers in mechanized mining and was one of the first coal operators to install and successfully operate mechanical loading machines. Among his many contributions to the industry were the timber-setting machine and mine jeep.

ROBERT M. SEARLS

AN APPRECIATION
BY ALBERT F. KNORP

One of the foremost authorities in America on mining law, Robert M. Searls, succumbed to a heart attack on March 1 in San Francisco.

Bob Searls, son of a California lawyer and grandson of a Chief Justice of the California State Supreme Court, was born in Nevada City, Calif., 66 years ago. There was never any doubt in his mind as to what his vocation would be, for law was his natural bent. His boyhood in the heart of Nevada County's rich mining district, with its abundance of water, gave him a keen understanding of two of our great natural resources: metal and water, and he was to make a national reputation as an expert on water law and mining law when he entered practice.

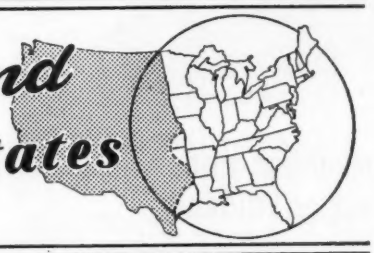
As counsel for the California Chapter of the American Mining Congress and the Gold Producers of California, Mr. Searls played a prominent part in shaping legislation in California which pertained to mining, water pollution and water conservation during the past 25 or 30 years. His ready understanding of what a proposed law might have done, prevented the passage of many bills which could have been detrimental to the industry.

There has hardly been an important mining case taken into the California courts in the past 20 years that Mr. Searls did not participate in as counsel; nor can it be said that he had a decision go against his clients.

Surviving are his widow, Gertrude Searls, and children, Frederick T. Searls, Mrs. Roberta Giacobbi and Mrs. Anne Janss, as well as a sister, Mrs. Helen Bray and brothers Fred Searls, president, Newmont Mining Co., Dr. Henry H. Searls, Carrol Searls, an attorney and Niles P. Searls.

NEWS and VIEWS

Eastern and Central states



Zinc Men to Meet

The 35th annual meeting of the American Zinc Institute will be held at the Hotel Statler in St. Louis, Mo., on April 27 and 28.

A special feature of the Monday morning session will be an address by Hon. Dewey Short, Republican Congressman from Missouri and chairman of the House Armed Services Committee. Other speakers will discuss topics of interest to the zinc industry, including current and new developments in zinc markets.

The annual dinner and smoker will be held on Monday night, April 27.

R. H. Sherwood Gets Award

The first annual award for outstanding leadership on behalf of industry-sponsored coal research was presented to R. Hartley Sherwood, president of the Central Indiana Coal Co., by Bituminous Coal Research, Inc., the national research agency of the bituminous coal industry.

The award was set up by the Board of Directors of Bituminous Coal Research, Inc., to stimulate technical progress in the bituminous coal industry. It honors men who have exerted outstanding leadership contributing to the progress of industry-sponsored coal research.

Mr. Sherwood was cited for his active, continuous interest on behalf of coal research over the past 19 years.

Mr. Sherwood, who is also president of the Sherwood Templeton Coal Co., Little John Coal Co., Stonefort Corp., and Antioch Power Co., has conducted major strip mining operations over a longer period than any other person now engaged in this type of mining. His first major strip mining operation was begun in Danville, Ill., in 1925.

Paradise Now Operating

Paradise Colleries, the large new stripping operation owned jointly by West Virginia Coal and Coke Co. and the Pittsburgh & Midway Coal Mining Co., ran its first coal on February 16. The mine is located near Drakesburg, Muhlenberg County, Ky.

When production gets into full swing, the mine is expected to produce 1,000,000 tons of fuel a year.

U. S. Steel Wins Safety Award

The award of honor, highest recognition given by the National Safety Council, was presented U. S. Steel Corp. for a record of less than one day lost per 1000 man-hours worked. Representing 200,000 plant workers, U. S. Steel President Clifford F. Hood accepted the award from Ned H. Dearborn, president of the council.

"In order to merit this award, United States Steel's accident frequency rate in 1952 was only 2.17 injuries per million man-hours worked," Dearborn said. "This is 52 percent lower than the 1951 National Safety Council's rate for the entire steel industry. U. S. Steel's accident severity rate of less than one day lost per 1000 man-hours worked was also lower than the 1951 industry rate."

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Looking For Engineers

The United States Civil Service Commission has announced an examination for mining engineer for filling positions paying from $3,410 to $10,800 a year in the Bureau of Mines of the Department of the Interior in Washington, D. C., and throughout the United States. Positions in other Federal agencies may also be filled.

No written test is required but applicants must have had appropriate education or experience or a combination of both.

Applications will be accepted until further notice and must be filed with the Board of U. S. Civil Service Examiners, Bureau of Mines, U. S. Department of the Interior, Washington 25, D. C.

Full information and application forms may be obtained from the U. S. Civil Service Commission, Washington 25, D. C., or from most first- and second-class post offices.

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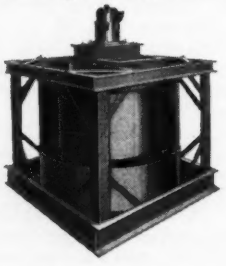

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Clover Splint Sold

The sale of its Clover Splint Mine, at Closplint, Harlan County, Ky., was announced by S. M. Cassidy, president, Consolidation Coal Co. (Ky.), division of Pittsburgh Consolidation Coal Co., to the Closplint Coal Co., a new corporation with main office at Closplint. Pittsburgh Consolidation Coal Co. will continue as sales agent for the output of the mine. Principal officers and owners of the new Closplint Coal Co. are Henry Shackleford, of Closplint, and Charles D. Cole, of Harlan.

The Clover Splint Mine was opened in 1926 by the Clover Splint Coal Co., of which the principal officers were Howard N. Eavenson, recently deceased, and Newell G. Alford, both of Pittsburgh. Due to the excellent quality of its splint type coal, the 1500-tpd mine has always enjoyed excellent operating time. The mine itself is 1400 ft vertically above the level of the tipple in the valley and is connected to it by a spectacular incline 4500 ft long.

In coal mine safety, the Clover Splint operation has achieved one of the outstanding records in the United States. Through 100 percent training of all of its employes in accident prevention and first aid and by maintaining the mine in first-class shape, the frequency rate of accidents has been lowered to a point where it is not only one of the safest coal mines in the United States, but one that also can be compared favorably with the safest manufacturing and other industries. In recent years the mine has won many regional, state and national championships in first aid and mine rescue.

In 1944 the old Clover Splint Coal Co. was acquired by Pittsburgh Coal Co. In late 1945, that company merged with Consolidation Coal Co. to form Pittsburgh Consolidation Coal Co., since which time the mine has been operated by its Consolidation Coal Co. (Ky.) division.

New Coal Export Firm

To meet the increased needs for high quality metallurgical coking, gas and steam coals from American mines by foreign buyers, especially those in the Orient who are cut off from the coal-producing fields of China and Manchuria, Shriro Trading Corp. has formed the Shriro Coal Corp. as a division of the parent firm. The new corporation is to take over and expand the functions of the Coal Department of Shriro Trading Corp., which has been actively engaged in the export of high quality American coals.

Maurice Cahn, second vice-president, is currently handling the affairs of Shriro Coal Corp. in New York, including chartering of vessels.

Win Safety Award

The Indiana Coal Operators Association has awarded its Templeton Trophy for safety to the Ingle Coal Corp., operator of the Ditney Hill mine near Elberfeld, Ind. This is the second straight year that the award has been made to Ingle Coal Corp. The trophy, originated by the Indiana Coal Operators Association in 1936 and dedicated to John A. Templeton, pioneer in the mining industry, is awarded each year to the mine in the association with the best safety record. Approximately 300 persons are employed at the southern Indiana slope mine.

Raise British Coal Prices

The British government has raised the price of coal ten percent in a determined effort to bring the industry out of the red. This is the biggest single price hike since the pits were nationalized on January 1, 1947.

BCR-Alco Sign Agreement

Development of a coal-burning gas turbine has reached the stage that intensive work on possible commercial applications, particularly for locomotives, is to get under way. This was the basis for a joint announcement made recently by president Roy B. White of the Baltimore and Ohio Railroad, who is chairman of the Locomotive Development Committee of Bituminous Coal Research, Inc., and Perry T. Egbert, president, American Locomotive Co., of an agreement between the coal industry's research agency and Alco that will make possible a stepped-up developmental program.

The two executives said that a contract had been signed between Bituminous Coal Research, Inc. and the American Locomotive Co. Under this agreement, Alco will carry on development of the turbine for commercial applications and design a chassis for locomotive use. The joint program of continued research and development will be carried out by BCR's Locomotive Development Committee and the locomotive-building firm.

Researchers for the Locomotive Development Committee, representing a group of nine major coal-carrying railroads and five of the nation's largest coal companies, have carried on the coal-burning gas turbine research program since 1945. An extensive high temperature test program was completed recently at the Dunkirk (N. Y.) plant of the American Locomotive Co., with bituminous coal being used exclusively to fuel a 4250-hp turbine of a type contemplated for locomotive use. Future plans of the joint BCR-Alco project call for further development of power plant components and additional operation of the Dunkirk experimental equipment prior to road service tests.

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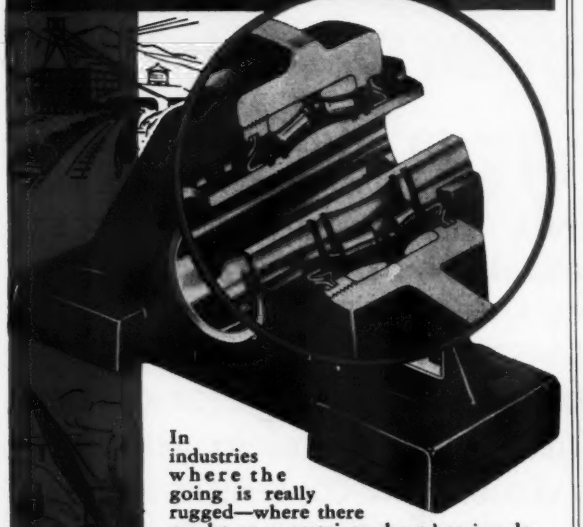

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Oil Looks at Synthetic Fuels

The National Petroleum Council has completed a $500,000 study in which it concluded that Bureau of Mines proposals for the manufacture of synthetic gasoline from coal and oil shale are "definitely uneconomical under present conditions" and that "the need for a synthetic liquid fuel industry in this country is still in the distant future."

In its summary of the study, the NPC also cast doubt on the value of the Bureau of Mines' multi-million dollar demonstration plants and questioned "the wisdom of government financing" of these huge experimental units.

The NPC undertook its 2½-year investigation of the Bureau's design and cost data at the request of the Secretary of the Interior.

After exhaustive analysis the committee concluded that: Gasoline manufactured from oil shale would cost the wholesale purchaser 14.7 cents a gallon.

Gasoline made from coal by the Bureau of Mines Fischer-Tropsch process would cost 29.4 cents a gallon. And, gasoline made from proposed hydrogenation processes would cost at least 36.3 cents a gallon.

These wholesale prices would all exceed the current wholesale price of gasoline refined from crude petroleum which is about 12 cents a gallon at the refinery or terminal. Wholesale prices do not include sales taxes and marketing and transportation expenses.

The committee further concluded that "there is some likelihood of further reducing the cost of manufacturing liquid synthetic fuels by continued research in oil shale and Fischer-Tropsch processing of coal. Coal hydrogenation, on the other hand requires drastic improvements in existing methods to permit economic operation. Such developments are not foreseen at the present time."

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Coal Institute Election

M. E. Prunty, safety director of the Consolidation Coal Co. (Ky.) has been elected president of the Big Sandy-Elkhorn Coal Mining Institute. He succeeds A. M. Ayers, general manager of the Russell Fork Coal Co.

At the meeting of the group, held at Wheelwright, Ky., a mine-safety lamp was presented to W. A. Pack, foreman of the Inland Steel Co. coal mine. The award was in recognition for his outstanding safety record. For eight consecutive years, there have been no lost-time injuries to any employe under his supervision.

Participate In Erie Mining

A ten percent interest in the Erie Mining Co. has been purchased by The Steel Co. of Canada, Ltd., from Youngstown Sheet & Tube Co.

Erie Mining Co. is working on a large taconite project on the Mesabi range in Minnesota. Pickands Mather & Co., manager of Erie, also reported that Interlake Iron Corp.'s interest in the Erie Co. has been increased to ten percent.

Erie now is owned as follows: Interlake and Steel Co. of Canada, ten percent each, Youngstown Sheet & Tube, 35 percent and Bethlehem Steel Corp., 45 percent.

Wheels of Government

(*Continued from page* 116)

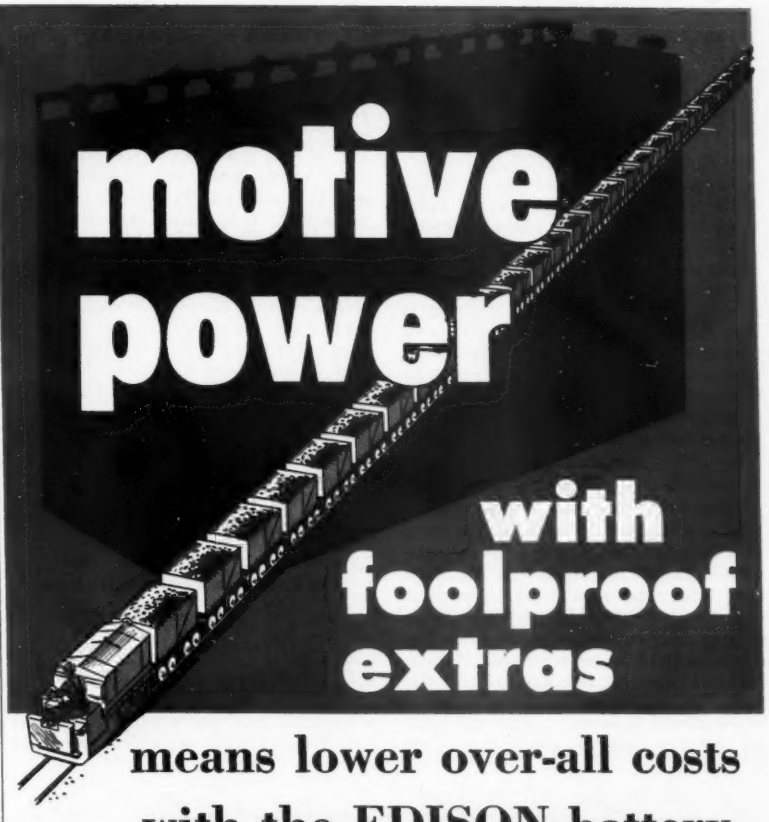
the hearings and will set forth its recommendations to the proper Congressional committees for their consideration and possible action.

Coal, Lead, Zinc Seek Aid From Excessive Imports

Faced with a serious flood of foreign residual oil into this country, the coal industry, supported by mine labor, railroads, and independent oil producers, has urged Congress to impose import quotas on this product.

Numerous measures restricting the flow of foreign residual oil to no more than 5 percent of domestic demand for the fuel in the corresponding calendar quarter of the previous year have been tossed into the legislative hoppers and sentiment is mounting within Congress for adoption of this restriction.

The lead and zinc mining industries, likewise harmed by heavy imports from abroad and a falling off of demand, are uniting behind proposals to set up a sliding scale import tax on the two metals which would offer protection to the domestic industry and enable U. S. mines to keep operating. Steam is gathering behind this proposal and members of both the House and the Senate are optimistic that some action may result at this session.



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. . . Because they don't require critical regulation of charge rates, EDISON batteries can be charged directly from a mine's d-c power supply. They can be fully charged in 6 to 7 hours . . . require no equalizing . . . which helps get charging done during off-peak periods at lower cost.

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. . . With steel cell construction and a solution which is a recognized preservative of steel, EDISONS are built to stand the rough abuse incidental to mining operations.

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. . . Many users report 2 to 3 times longer life with EDISONS than with other type batteries. They are so dependable that they are frequently used for lighter duty service on telephone and alarm circuits or emergency lights after being retired from heavy haulage work.

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STORAGE BATTERIES

BCR Annual Meeting

THE annual membership meeting of Bituminous Coal Research, Inc., was held in Cincinnati, Ohio, on March 6. Theme of the meeting was, "More Research for More Markets."

In his opening address A. A. Potter, BCR president, emphasized the great need for research by the bituminous coal industry. He pointed out that coal research must be directed toward maximum satisfaction for coal customers, and must be on a sufficiently long-range basis to create entirely new coal using equipment, new processes and new coal markets. In addition, he said, the industry must not neglect basic research to build a foundation for further applied research.

Gas Turbine Research

Walter J. Tuohy, president, Chesapeake & Ohio Railway Co., reviewed the work done by BCR's Locomotive Development Committee. He disclosed that BCR had signed an agreement with the American Locomotive Co. to step-up the development program on coal-burning gas turbines. Tuohy pointed out that the big "if" in the future of a coal-burning gas turbine locomotive is economics. Current studies indicate that the gas turbine now envisioned will have a slight advantage over diesels. The margin, however, is nothing like that of diesel over steam power. A shift to higher costs for oil and lower costs for coal, however, would make the proposed locomotive extremely attractive. He warned, however, that this would not mean that the market loss to diesels would be regained. Because of the higher efficiency of gas turbines over steam, if all railroad locomotives except diesel switchers were replaced by gas turbine locomotives, the annual coal consumption by railroads would reach 35,000,000 tons—predicted for railroad use in 1953.

John I. Yellot, director of research, and Peter R. Brockly, assistant director of research, Locomotive Development Committee, BCR, then brought the group up to date on the committee's technical work.

Markets Via Cost Reduction

This was the theme of a paper by L. Newton Thomas, president, Carbon Fuel Co. Thomas stressed the role of research in the development of markets and reduction in cost of aluminum, iron and steel. He pointed out that through expanded research, the coal industry, too, can increase its market.

G. von Stroh, director of development, Mining Development Committee, BCR, spoke on the opportunities in continuous mining research. He brought out that it takes both time and money to make a research program pay off. However, he added, it does pay off.

According to L. C. Campbell, vice-president, Eastern Gas & Fuel Associates, research into new uses can do more to change the economic course of any industry, including coal, than any other effort.

"Opportunities for an Expanding and Prosperous coal Industry" was the title of the paper, given by Harold J. Rose, vice-president and director of research, BCR. He outlined a long list of research projects under way, their present status and their future.

At the annual luncheon, Dr. E. R. Weidlein, president of Mellon Institute, gave an address entitled, "Research to Build Markets and Profits."

The 1953 BCR award for industry leadership on behalf of coal research, a bronze plaque, was presented to R. H. Sherwood, president of the Central Indiana Coal Co. by Dr. Potter. This award was set up by the board of directors of BCR to stimulate technical progress in the bituminous coal industry. It honors men who have exerted outstanding leadership by contributing to the progress of the industry's sponsored coal research.

National Mine Rescue Contest

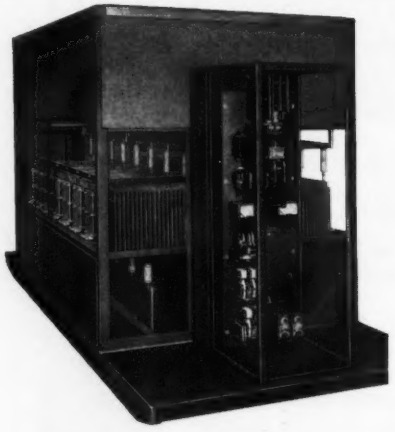
The national first-aid and mine-rescue contest will be held at Fort Wayne, Ind., September 29 through October 1. The three-day, nation-wide affair is the second such contest since World War II.

New Lead-Zinc Mining Industry

A new mining industry is establishing itself north of Joplin, Mo. Using large earth-moving equipment, mine operators are working ore pockets near the surface, known as "slumps," which were bypassed in older mining operations. The mining industry has known of the existence of these slumps since the early days of the field, but the material is sticky and unsuitable for deep mining. With the large equipment available today, it is economical to mine them by open-pit methods.

The last two years have seen four firms enter the field. Latest of the four is the Frojo Mining Co. After drilling 40 test holes, Frojo has blocked out an ore body on a 225-acre tract 15 miles north of Joplin.

The company is building a mill capable of processing 200 tons of ore an hour and is busy removing overburden from a pit 1200 ft long and 400 to 500 ft wide.



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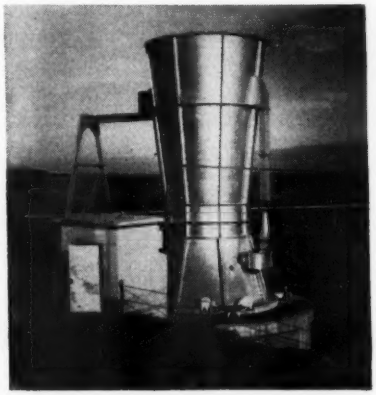
Unique Ventilation System at Creighton

Only one of its type in Canada, a towering 20-ton exhaust fan, has been installed by the International Nickel Co. of Canada, Ltd., to ventilate the underground workings of the new caving project at its Creighton Mine in the Sudbury District of Ontario.

The giant vertical fan, driven by a



350-hp motor weighing five tons, moves air at the rate of 300,000 cfm. The fan draws the air down from the surface, directly through the caved or broken ore, circulates it through the underground workings and carries it back to the surface through the main return shaft.

As the Creighton caving program took shape on the drafting boards, primary consideration was given to devising a ventilation system which would provide for the flow of a steady stream of fresh air through the slusher drifts. The unique ventilation system is effectively servicing the caving project as it has been developed to date, and has ample capacity to handle ventilation needs under maximum operating conditions.

Coal's Future Bright

Electricity well could become the substitute for a billion barrels of oil by 1975, according to George A. Lamb, manager of business surveys of Pittsburgh Consolidation Coal Co.

Speaking before the Electric League of Western Pennsylvania at a luncheon meeting, Lamb predicted a phenomenal increase in the use of electric power as soon as there is a decline in the supply of oil and natural gas.

This extra shift to electricity, he said, may begin about 1960, or shortly thereafter, which is when many experts believe the United States will have passed its peak production in petroleum. The peak and decline in natural gas should follow petroleum by a few years.

The coal economist points to the disparity between the distribution of the demand and the long-range supply of the respective mineral fuels as the key to an accentuated emphasis on electric energy. If supplies were unlimited, petroleum demand could soar to seven billion barrels annually within 25 years. But it will be impossible to obtain from domestic production plus imports, even half of this amount.

Adjusting supply to demand will mean: (1) The cutback of many present oil uses to coal; (2) The use of shale oil and coal-based synthetics; (3) The use of new developments such as the coal gas turbine; (4) A tremendous increase in the use of electric power, most of which will have to be based on coal as the source fuel.

The implications of the developments predicted by Mr. Lamb are tremendous, even if the timing of the trend is premature by five or ten years.

Look At Low Grade Iron

State legislators from Michigan's Upper Peninsula are seeking funds for research efforts to tap low grade iron ore deposits in the Upper Peninsula. Money would be used to build a research center at Michigan College of Mining and Technology at Houghton, Mich., and would launch an experimental program within two years.

Sells Tri-State Holdings

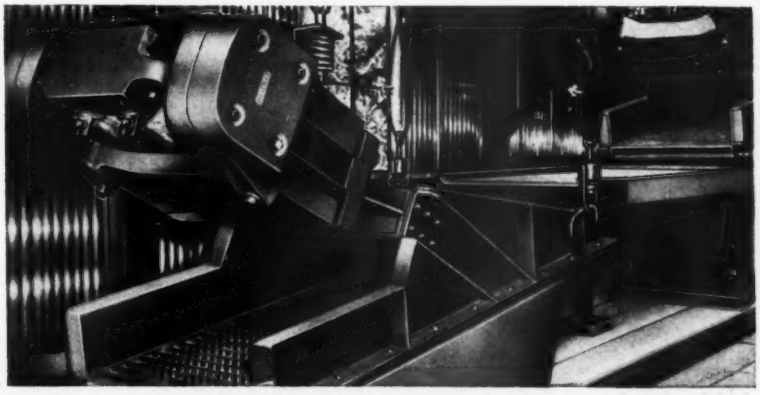
The Muncie operation holdings of O. W. Bilharz, long-time mining operator in the Tri-State district, have been sold to the Eagle-Picher Co. The group of leases is about one and one half miles north of Picher, Kan.

The leases, which had been banded together into the Muncie operation since 1946, include the Tar Creek, Southern, Early Bird and Elk operations. All had been in operation since early mining days in the district.

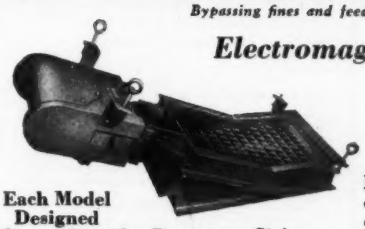
To Up Lithium Production

The Foote Mineral Co. has reported that it is tripling the capacity of its lithium plant now being constructed at Sunbright, Va. Sunbright is presently designed to process approximately 1500 tons of spodumene per month.

The mill at Sunbright has been redesigned from start to finish and additional mining equipment has been purchased and is already in use at the company's Kings Mountain, N. C., mine. New crushing equipment with capacities exceeding 1000 tpd will soon be installed. Parallel circuits will be a feature of the new plant layout as well as expanded facilities for handling the recovery of tin and columbite by-products.



Bypassing fines and feeding coarse materials onto Syntron Picking Table



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Break Safety Record

In 1930 the Nellis Mine of Armco Steel Corp. at Montcoal, W. Va., established a safety record of 188 consecutive accident-free days. This record has stood and has not been broken in 23 years until February 23, 1953. On February 23 the Nellis Mine had completed 189 consecutive accident-free days, and this record still continues. During the last 189 days they worked approximately 210,000 man-hours and mined 160,000 tons of coal. The last major accident occurred August 18, 1952.

There are 270 employes at this mine including 20 supervisors and office personnel. Mine officials include J. F. Trusley, mine superintendent; G. W. Clendenin, general mine foreman; Carl Javins, general night foreman; and Charles Pierpoint, general outside foreman.

This record has been achieved by the close cooperation of all supervision and mine employes, according to C. O. Kane, manager of Armco's Mining Division, who announced the achievement.

Drive on Residual Imports

Members of the Foreign Oil Policy Committee have formulated plans for a concerted drive to carry out objectives of a resolution passed at a conference in Washington, D. C. Labor and management representatives of anthracite, bituminous coal, domestic oil, railroads, and small business interests spoke out against the unrestricted flow of foreign residual oil imports that are damaging the nation's economy and security. Following is the full text of the resolution:

"The rising tide of foreign residual fuel oil imports poses a critical threat to the basic industries of this nation and those employed therein. This excessive importation jeopardizes the military and domestic economy of the nation. This over-all and continuing adverse impact of foreign residual fuel oil importations requires immediate action by the Congress. The prejudicial effect of this oil importation has been felt on national, state, and local levels, governmental and industrial, and accordingly it is agreed that all interests should immediately consolidate their efforts with a view to securing prompt remedial action by the Congress. We who are present pledge ourselves to effectuating these purposes."

Dr. R. E. Snoberger, president of Truax-Traer Coal Co., and chairman of the National Coal Association Committee on Natural Resources, presided at the conference. Twenty speakers, including mine union, railroad brotherhood, and industry officials, addressed the meeting. Among these were Wm. I. Powell who assured the committee of American Mining Congress support. All pledged full support for legislation designed to protect American industry and labor against the foreign residual fuel.

At a press conference at the close of the meeting Dr. Snoberger explained that out of the meeting had come a permanent organization to be known as the Foreign Oil Policy Committee.

Thomas Kennedy, vice-president of the United Mine Workers of America, C. J. Potter, president of Rochester and Pittsburgh Coal Co., and Russell B. Brown, general counsel of the Independent Petroleum Association of America, all made statements in support of the drive to limit importation of foreign residual fuel oil and answered newsmen's questions.

In both houses of Congress, bills have been introduced to limit fuel oil imports to 5 percent of domestic demand for the corresponding calendar quarter of the previous year.

FOR SALE: GOOD USED EQUIPMENT

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MOTOR GENERATORS

1—500 KW West. Syn. 275 V 900 RPM
2—300 KW West. Syn. 275 V 1200 RPM
3—200 KW G.E. Syn. 275 V 1200 RPM

These are 3 phase, 60 cycle, 2300/4000 V, complete with switchboards and full automatic AC and DC switchgear.

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1—100 KW G.E. Syn. 275 V 1200 RPM

These are complete with switchboards, switchgear, and single phase transformers for 2300 V.

1—300 KW West. Mine Type Rectifier

ELECTRIC HOISTS with Cylindro Conical Drums for Shaft Mines

1—1650 HP Nordberg
2—1400 HP Vulcan
1—1300 HP Nordberg
1— 900 HP Nordberg
1— 850 HP Ottumwa
2— 800 HP Vulcan
1— 500 HP Hardie-Tynes
1— 400 HP Ottumwa
1— 350 HP Vulcan
1— 350 HP Vulcan Double Drum

ELECTRIC HOISTS with Single and Double Drums for Slope and Drift Mines

1—700 HP Nordberg Single Drum
1—600 HP Lidgerwood Single Drum
1—600 HP Nordberg Single Drum
1—300 HP Connellsville Single Drum
1—500 HP Vulcan Double Clutched Drum
1—500 HP Wellman-Seaver-Morgan Double Clutched Drum
1—450 HP Vulcan Double Drum
1—400 HP Vulcan Double Clutched Drum

Complete specifications on the above Hoists, such as motor characteristics, rope speed, rope pull, size and amount of rope drums will spool, etc., furnished on request together with our low prices.

LOCOMOTIVES, 250 V DC, BALLBEARING—TRACK GAUGES FROM 24" TO 48"

2—20-ton Jeffrey, MH-77
2—15-ton West. 910-C4
2—15-ton West. 908-C
2—15-ton Goodman 36-A
5—15-ton Jeffrey MH-110
2—13-ton G. E. HM-829
4—13-ton G. E. HM-827
2—13-ton Jeffrey MH-110
4—10-ton Goodman 34-B
3—10-ton G. E. HM-829
4— 8-ton G. E. HM-834 with reels
2— 6-ton Jeffrey MH-88, 28" ht.
15— 6-ton G. E. HM-835, 26" ht.

Complete with new Jeffrey steel strip resistances. All have been rebuilt and any part showing any wear was replaced with new. Guaranteed 100 per cent against electrical and mechanical defects.

STEEL TIPPLES AND WASHERS

1—5-Track Steel Tipple with Link-Belt No. 5035 Washer, 250-300 tons per hour capacity, complete with 4 large loading booms, shaker screens, vibrating screens, and all necessary appurtenances. Like new.

1—5-Track Jeffrey Steel Tipple with 4 large loading booms, shaker screens, rescreening plant, equipped with Nordberg mesh screens, capacity 200 tons per hour, 8' shaker screens, coal cleaner. Jeffrey 36 x 36 coal crusher, motors and all necessary appurtenances. Several other 3- and 4-track steel tipples suitable for strip, drift, slope or shaft mines.

LOADING MACHINES, 250 V DC

6—Joy 14-BU-3PE
4—Joy 14-BU-7RBE
6—Joy 11-BU
15—Joy 8-BU Low Type
10—Joy 7-BU
5—Goodman 460
4—Goodman 360
6—Goodman 260
5—Jeffrey L-600
2—Jeffrey L-500
2—Myers-Whaley No. 3 Automats, practically new.

PERMISSIBLE TYPE, 250 V DC

6—Jeffrey 29-U rubber tire mounted
3—Jeffrey 29-U cat mounted
4—Jeffrey 29-U track mounted
2—Jeffrey 29-L rubber tire mounted
3—Goodman 324-AA rubber tire mounted
5—Goodman 324-AA track mounted
10—Jeffrey 35-BB
4—Jeffrey 35-BC
12—Sullivan 7-B
6—Goodman 512 on cats

AC CUTTING MACHINES—220/440 V

2—Jeffrey 29-U
1—Jeffrey 24-B
3—Jeffrey 35-BB
1—Jeffrey 35-L
5—Goodman 1263
5—Goodman 11263
4—Goodman 11263A
2—Goodman 11206JA

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Several lots of Rotary Dump, End Dump and Drop Bottom Mine Cars for high and low vein mines. Mail us your inquiries. We have them in lots from 100 to 600; track gauges 36"-40"-42"-44".

ALL TYPES OF CABLE REEL SHUTTLE CARS, 250 V DC

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That's A Lot of Water

The Lehigh Navigation Coal Co.'s Greenwood Mine near Coaldale, Pa., offers a typical view of underground pumping installations at the company's anthracite mining properties. This photograph was made on the fifth level, 800 ft underground. Here, there are three 9-in., 8-stage Barrett-Haentjens pumps of 2000 gpm capacity, with an 800-ft head. The synchronous electric motors are 650 hp operating at 750 rpm

Nineteen fifty-two was the wettest year yet!

This is the news from the engineering corps of the Lehigh Navigation Coal Co. at Lansford, Pa. The department has carefully measured rainfall almost half a century, but the 69.96 in. that fell last year set a high never before equalled.

What's more, 1952 produced two of the rainiest months since 1907. April, with 9.48 in., established a peak fall for that particular month, and so did November, with 9.12 in.

Eight billion, 911 million gallons of water had to be removed from the anthracite mines of the Panther Valley or 16½ tons of water pumped for every coal hoisted in 1952! Water pumped for each ton of coal hoisted in the average year from 1907 to 1952 came to only 7.81 tons—less than half of last year's load.

In 1952, a total of 38,857,000 kilowatt hours of pumping went into the mine pumping operations of Lehigh Navigation Coal Co. This compares with 27,000,000 plus kilowatt hours in 1951 for pumping, 26,000,000 plus kilowatt hours in 1950, and 20,000,000 kilowatt hours in 1949.

Open Plummer Iron Mine

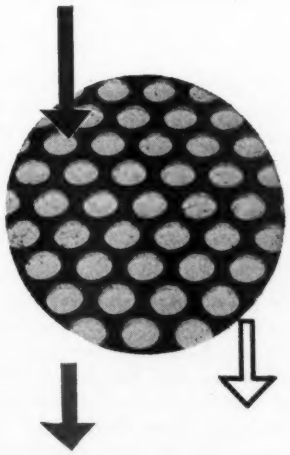
Opening of U. S. Steel's new Plummer open-pit iron mine near Taconite, Minn., has been announced by R. T. Elstad, president of Oliver Iron Mining Division of U. S. Steel. Development plans include construction of an ore washing plant and accessory facilities.

The Plummer mine is located between Holman and Judd mines, which were operated by Oliver from 1907 to 1925. At that time ore was transported by rail to the Trout Lake concentrator for beneficiation. Under present plans an ore-treating plant, capable of producing annually 1,200,000 tons of iron ore concentrates from approximately 2,500,000 tons of low grade material, will be built at the edge of the mine.

This will be the sixth plant Oliver has put into operation to carry out its long-range plan of developing low grade ores to conserve direct shipping ores.

In Coal Preparation...

it's the SIZE that counts!



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Delays due to costly blinding are reduced to an absolute minimum — decks can be changed easier, faster — and downtime for repairs is practically eliminated — when Hendrick Perforated Plate is used.

Available flat, corrugated or stepped with any desired shape and size of perforation in proper gauges of regular, high carbon, and high tensile steels and in other commercially rolled metals. Write for more details.

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"... More than 6,000 of our employees are now participating ..."

MELVIN H. BAKER
Chairman of the Board, National Gypsum Company

"The Payroll Savings Plan for Bonds provides a convenient and profitable way for America's wage earners to save. Millions of Payroll Savers have become proud owners of homes purchased with Bonds bought this way. It also helps our national government with its problems of managing the public debt. We in National Gypsum urge the stimulation of the Payroll Savings Plan and are proud to report that more than 6,000 of our employees are now participating."

Here's another success story of a person-to-person canvass:

In the Wahoo (Nebraska) ordnance plant of the National Gypsum Company, employee participation in the Payroll Savings Plan was a very low 1.73%.

In September of last year, with the whole-hearted encouragement of top management, the 3,000 employees of Gypsum's Ordnance Plant organized to conduct a person-to-person canvass to put a Payroll Savings Application Blank in the hands of every employee.

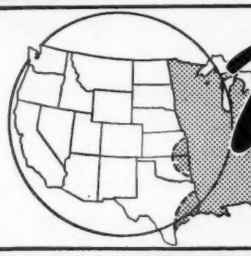
90% of the employees signed up in the opening days of the campaign. By September 12th, employee participation was 93.7%. On October 2nd, participation was almost 97%—and still going up.

To quote from National Gypsum's printed report of the Payroll Savings campaign:

• "Did we use fancy charts! Did we use advertisements? Did we have long-winded meetings. Did we give prizes for production? The answer is No! We put the proposition squarely to the people, and we reported to the people once a week in bulletin form to let them know where they stood in relation to other departments as well as to the plant total. Once the spirit of competition and teamwork caught fire, once it became a matter of personal pride; a successful conclusion was only a matter of time and effort."

Justifiably proud of its sponsorship of the Payroll Savings Plan and the 97% enrollment of its employees, National Gypsum Company prepared a very interesting folder, "Bombs and Bonds for National Defense. The Savings Bond Program of the National Gypsum Company." Savings Bond Division, U. S. Treasury Department, Suite 700, Washington Building, Washington, D.C., will be glad to send you a copy. Read how easy it is to build *your* Payroll Plan to 90% or more participation.

The United States Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America.



Western States

Discusses Lead-Zinc Import Tax in Australia

In an address before the Australasian Institute of Mining and Metallurgy, Mr. Andrew Fletcher, president of the St. Joseph Lead Co. and president of the American Institute of Mining and Metallurgical Engineers, detailed the reasons for the proposed adoption of an equalization import tax on lead and zinc entering the United States. Although he welcomed complete free trade throughout the world, he said that as long as there were international trade restrictions of various kinds, consisting of multiple exchange rates, import and export quotas, devaluation of currencies, and the establishment of quotas, as well as domestic subsidies, the American mining industry had to devise some means of protecting its own interests and that a sliding scale import tax would be the least objectionable device. He called attention to the fact that the imports of lead last year were 637,000 tons, compared with imports of only around 75,000 tons before World War II, and that domestic mine production had declined to 375,000 tons. Mr. Fletcher did not look with favor upon the use of import quotas which, he said, would entail enormous complications for the importer.

"Who would think from the downward trend of the metals in recent months that, only a year ago, the entire world was imbued with the idea of serious and permanent metal shortages? Our government was using extraordinary efforts to stimulate production all over the world and buying with frenzy. I never subscribed to the doctrine of metal shortages, even at the height of the hysteria, and I so advised my friends in Washington. I believed that the shortages were artificially created, largely by the intervention of governments in metal markets. There can be no shortage of any commodity in a market where supply and demand function, for the price of the article will provide automatically a mechanism by which any maladjustment is corrected," said Mr. Fletcher.

He also made a plea for better treatment all over the world of American capital, pointing out that it could do an excellent job in developing the mineral resources of other countries, if given the opportunity by friendly governments, granting the same protection to foreign capital as it gives its own. "Some day," said Mr. Fletcher, "there must be a change from the present deplorable antipathy to capitalism. The world will again discover that progress is greatest where freedom prevails, and this applies not only to freedom from governmental interference in the market for commodities but to freedom of foreign exchange and mobility of capital."

Push Allen Production Up

Coal production from the Colorado Fuel & Iron Corp.'s new Allen mine near Stonewall, Colo., is being boosted daily with the east and west portals now in operation. Output of coal from the west portal was started last year and recently got under way from the east portal. The Allen mine when in full operation is expected to be one of the largest producing coal mines in the West.

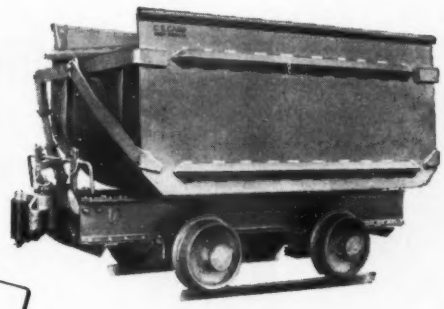
With the increase in production, more men are being added to the payroll daily. Many of them have come from Crested Butte, where C.F.&I. recently shut down and abandoned a coal mine. The steady increase in employes has caused the Trinidad-Stonewall area to be declared a critical housing area, and plans are being formulated for construction of more homes for the miners and their families. C.F.&I. also operates the Morley and Frederick mines at nearby Valdez. A total of 1,100 men are employed at the three mines.

New Unit for National Lead

The Texas Mining & Smelting Division of National Lead Co. will be operated as a part of the company's metal department, according to a recent announcement. This division, with headquarters in Laredo, Tex., has antimony mines in Mexico. Ore from these mines is processed at Laredo into antimony metal and antimony oxide.

Mine and plant operations of the Texas Mining & Smelting Division will be directed by Gloyd M. Wiles, manager of National Lead's mining department.

Pick a winning Card!



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Montana Mining Association

Ted E. Collins, trustee for the Marysville Gold Mining Co., was elected president of the Mining Association of Montana, succeeding L. B. Manning, general manager of Trout Mining Div., American Machine & Metals, Inc. Manning was elected a member of the executive committee. Fred E. Burnet, superintendent, Montana Phosphate Products Co., was elected first vice-president; Charles S. Burris, plant manager of the Ideal Cement Co., was elected second vice-president; W. R. Allen, chairman, Bostana Mines Co., was elected permanent head of the resolutions committee and Carl J. Trauerman, president, Butte Copper Consolidated Mines, was re-elected secretary-treasurer.

N. M. Miners Move

Offices of the New Mexico Mining Association have been moved from Albuquerque to Carlsbad, N. M. This move is temporary until the board of directors decides where to establish permanent headquarters.

At this time, no one has yet been named to succeed Dwight Plackard as executive secretary of the mining association. Plackard resigned March 1.

Exploration at Hercules

Day Mines, Inc., is undertaking a large exploration project at its Hercules mine at Burke, Idaho. A lead-zinc exploration contract has been granted Day Mines by the Defense Minerals Exploration Administration.

According to a company spokesman, the funds will be used to deepen the Hercules shaft to 1600-ft and in lateral exploration on the 1600-ft level. The present bottom level in the Hercules is at the 1200-ft point.

Arizona Uranium Search

Discoveries of uranium containing ore bodies in the Kingman, Ariz., area have led the Atomic Energy Commission to test many mines and prospects in the region. Preliminary tests in at least seven localities near Kingman indicate possible large scale production of uranium. Showings of uranium are definite in a dozen other localities. These developments are cited as the primary cause of the AEC establishing a new sub-office for Arizona in Phoenix.

The initial discovery itself was accidental. A Geiger counter near a batch of ore samples, destined for the U. S. Geological Survey office in Salt Lake City became violently active. The samples were from the Detroit group of mines near the old Chloride-Mineral Park district.

Two primary districts are now under survey by the AEC, the Chloride and Mineral Park Districts in the Cerbat Mountains, and the Aquarius Cliffs region, northeast of Wickieup. Claim holders and mine owners are doing additional exploration work.

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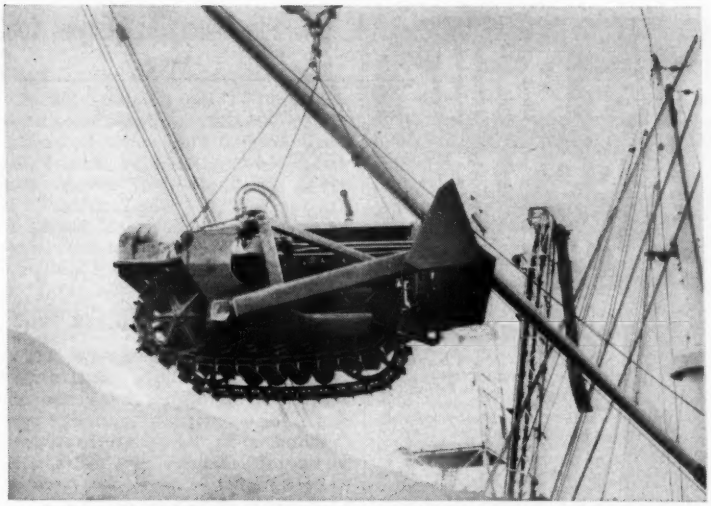

A Caterpillar D2 Tractor, attached with a bulldozer blade, is being lowered into the hold of an ocean-going vessel at the Port of Stockton, Calif. The little bulldozer will speed up the loading of the ore cargo by leveling it as it peaks up under the loader and by shifting the load to trim the ship.

Exploration at New Almaden

Cordero Mining Co. is continuing exploration from the Day tunnel in a search for additional cinnabar deposits at the New Almaden quicksilver property near San Jose, Calif.

The Day tunnel has been reconditioned for 3000 ft from the portal. An intensive diamond drilling program is being carried on to test areas where geological conditions are considered promising for existence of ore deposits.

Diamond drilling from the surface last year failed to disclose cinnabar in commercial quantities and the future of the world-famous quicksilver producer may be largely determined by results of later exploration.

Shale Research For AEC

The U. S. Atomic Energy Commission has announced a research program at Columbia University to develop methods of recovering uranium contained in the shale.

AEC has contracted with the U. S. Bureau of Mines to start operating a small experimental mine near Sligo, Tenn., to develop satisfactory methods of mining the shale in large tonnages. The Chattanooga shale formation, which underlies several southeastern states, has long been known to contain minute quantities of uranium. A widespread exploration drilling program is currently being conducted by the U. S. Geological Survey under contract to the AEC to obtain better knowledge of the uranium occurrences.

In the experimental mine, the Bureau will apply the research knowledge and experience in mining and processing shales at Rifle, Colo., to the harder and more refractory Chattanooga shale formation. This formation has a lower oil content than the western shales, and has no current economic value. Western shales, however, do not contain uranium.

Objective of the program at Columbia University is to develop a process for recovery of the uranium, which, although very low grade, constitutes an important potential reserve. AEC is attempting to develop effective processes for extracting uranium from all known domestic sources. Work at Columbia will be performed under a $550,000 contract, under the directorship of M. D. Hassialis, Professor of Mineral Dressing at the Columbia School of Mines. The work will be done in laboratories at Unit No. 1 of the new Engineering Center of Columbia University.

Magma Acquires St. Anthony

Magma Copper Co. has acquired substantially all of the property of the St. Anthony Mining & Development Co., Ltd., located at Tiger, Ariz. The St. Anthony company halted its business and mining operations in 1952. Its property adjoins that of the San Manuel Copper Corp., wholly-owned subsidiary of Magma, where a large low-grade copper ore body is being developed.

Primary purpose of the acquisition of St. Anthony Mining Co. is to get that firm's housing, dispensary and other buildings. It provides San Manuel with immediate housing and other construction not presently available.

Repair Fire Damage

Since fire destroyed the grading tipple of the Healy River Coal Corp. at Suntrana, Alaska, last August, a crew has worked continuously to construct a new tipple. It was put into operation the first of this year.

Much of the coal produced from the Healy River Coal mine is used in Fairbanks, Alaska, for domestic heating purposes.

Plan Research

Establishment of a new Industrial Development Department by the United States Smelting, Refining and Mining Co. was recently announced by W. C. Page, vice-president and general manager of western operations. The new department will be headed by J. M. Ehrhorn, until recently assistant to the manager of western mines of the company, as industrial development director. Boris Ashurkoff, formerly mechanical superintendent at the U. S. Co.'s gold dredging operations at Fairbanks, Alaska, will be industrial development engineer. R. A. Pallanch, consulting mill metallurgist, formerly mill superintendent at Midvale, will be associated with the new department.

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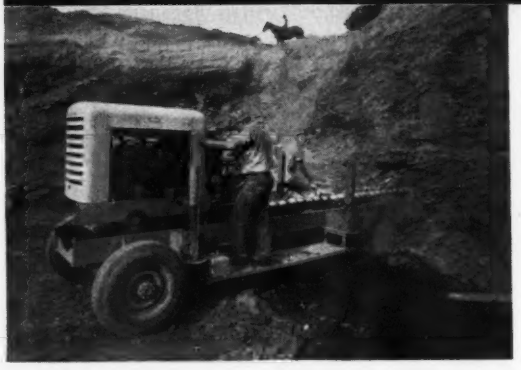
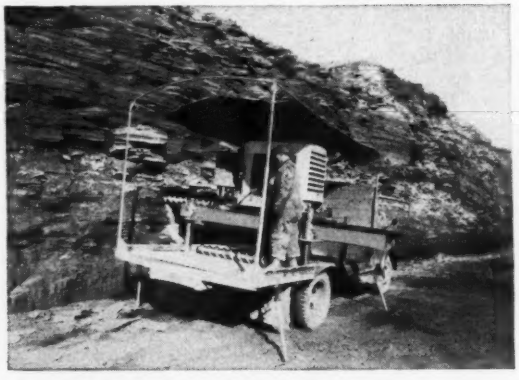


SELF-PROPELLED

Workers at Cedar Creek Coal Company, Stigler, Okla., using a McCarthy Self-Propelled Blast Hole Drill, bore through shale high-wall prior to blasting. Bill Mathews, Canton, Ohio, operator, drilled 1800 ft. of 6" diameter holes in one day using this same model. This drill works in tight quarters, and quickly adjusts on four separate leveling jacks to proper drilling height. Drills 4" to 12" blast holes up to 120 ft. deep. Excellent for low level work as shown here.



HORIZONTAL TRUCK-MOUNTED

A truck-mounted Horizontal McCarthy Blast Hole Drill at work at the Lingle Coal Company, Shawville, Pa. Rugged, fast, mobile and powerful, this unit bores 4" to 12" holes, averaging 1500 ft. per day with a two-man crew. McCarthy Drills work easily to depths of 100 ft. or more using 6-ft. auger sections. Being truck-mounted, all equipment, auger sections and operators are up out of the mud . . . free to work easier and faster. Mobility of truck allows drill to be moved from hole to hole quickly. Saves time! Saves money!

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Colorado Alumni to Meet at Coal Show

Alumni of the Colorado School of Mines will have a get-together at the Coal Show. They plan a cocktail-dinner party on Monday evening, May 11, at 6 p. m., in the Penthouse Club, 715 Vincent Ave. The Penthouse Club is in downtown Cleveland, behind the Hollenden Hotel. All alumni of the school and their ladies are invited.

Repairing Central Eureka Mine

Central Eureka Mining Co. has announced that its lode gold mine at Sutter Creek, Calif., has been shut down for 90 days to permit the rebuilding of its two shafts. Approximately 90 maintenance, hoist, shaft and pump men, as well as supervisors, will remain on the job.

During the shutdown period a consulting firm will make engineering studies of ways to increase daily output to 350 tons of ore. The mine is reported to have been doing slightly better than 200 tpd at its former optimum rate.

Mineral Museum Open Year 'Round

The Mineral Museum at the Arizona State Fairgrounds will be kept open to the public the year round. The announcement was made by Charles F. Willis, chairman of the board of directors, Department of Mineral Resources.

Willis told the appropriations committee of the Arizona State Legislature that it had been the intention of the board to ask the legislature for a sufficient appropriation to make this museum available to the public on a year-round basis. However, upon learning that this was the plan, the larger copper companies of the state volunteered to provide the necessary funds to make this possible. Therefore, the request for the appropriation has been withdrawn.

Establishment of the State Mineral Museum is being made possible by six of the major mining companies: American Smelting and Refining Co., Inspiration Consolidation Copper Co., Kennecott Copper Corp., Magma Copper Co., Miami Copper Co., and Phelps Dodge Corp. These companies have agreed to underwrite the expense of opening the Museum and maintaining it on a year-round basis, and details of handling the project have been approved by the Arizona State Fair Commission, the State Auditor, and the Attorney General.

The Mineral Building already houses ore specimens of exceptional value and of a type which cannot be duplicated or replaced. Many are relics of the old days of beautiful ores, quite different from the types which can be found today.

Mining Men to Meet in Seattle

HEADS of the various arrangements committees for the 1953 Metal and Nonmetallic Mineral Mining Convention, to be held in Seattle September 20-23, have been announced by R. M. Hardy, General Chairman of the meeting.

Assisting Mr. Hardy, as Vice-Chairman of the General Committee, will be Glenn Carrington, president, Glenn Carrington & Co., and Drury A. Pifer, director, School of Mineral Engineering, University of Washington.

S. M. Strohecker, Jr., distict manager of E. I. du Pont de Nemours & Co., Inc., will serve as Chairman of the Trips Committee. Roy B. Earling, formerly vice-president of U. S. Smelting Refining and Mining Co., will be Chairman of the Welcoming Committee, which will see that visitors to the Convention feel at home in the Queen City of the Northwest.

The Publicity Committee will be under the leadership of Joshua Green, director, Sunshine Mining Co., as Honorary Chairman and L. A. Williams, vice-president, Puget Sound Power & Light Co., as Chairman.

A special feature of the Convention will be an early-morning Salmon Derby, for which arrangements are being made by a Committee headed by C. F. Holcomb, district manager, Thos. A. Edison, Inc.

Mrs. R. M. Hardy, as Chairman of the Ladies Committee, is planning a full program of special events for the entertainment of the ladies who attend the Convention.

Attendance at this most important meeting in 1953 is a prime requisite for all mining men who wish to keep abreast of the times. By fall the new Administration will have had almost nine months of government behind it, and policies should be well crystallized. Those who are present in Seattle should be in a position to formulate a Declaration of Policy setting forth the considered views of the industry on national issues that affect mining. Prominent legislators and leaders in Government will be on hand to join in the discussions.

At the technical sessions leading operating men will relate their experiences in the application of new tools and methods to the safer and more economical production of metals and minerals. The frank exchange of information that takes place at these sessions will contribute to a liberal education in the latest methods of mining, beneficiation and metallurgy.

Interest in this first AMC Convention ever held in Seattle is running high. The hotels have promised comfortable accommodations for all, but applications for reservations should be sent in early to the Seattle Hotel Association, 315 Seneca St., Seattle, Wash.

Drill Metaline District

An extensive drilling program is planned by the Columbia Lead and Zinc Mining Co. on its 500-acre property in the Metaline district of Washington. Work is scheduled to start as soon as weather permits. Two structures indicated by a radar geoscope will be tested.

Montana Geology Report

A report on the Cambrian geology of southwestern Montana has been released by the State Bureau of Mines and Geology, Dr. J. R. Van Pelt, Bureau director, announced recently. Written by Dr. Alvin M. Hanson, former geology professor at Montana School of Mines, the report is titled "Cambrian Stratigraphy in Southwestern Montana."

The Hanson report is one step in the Bureau's continuous program of helping the Montana prospector and mine operator in their search for ore. "Many orebodies in Montana occur in Cambrian rocks," said Dr. Van Pelt, "But these rocks underlie many thousands of square miles in the mountains of Montana, and are sometimes more than 2000 ft thick. The prospector needs to have guides to ore that will narrow his search."

The Hanson report is listed as Memoir No. 33 and can be obtained for $1.00 from Montana School of Mines in Butte.

To Build Reno Mines Station

Secretary of the Interior Douglas MacKay has announced the awarding of a construction contract for the Bureau of Mines Rare and Precious Metals Experiment Station at Reno, Nev. The Nomellini Construction Co. at Stockton, Calif., will do the work.

The station is to be situated on a 4¾-acre tract adjoining the campus of the University of Nevada. The site was deeded to the government by the state of Nevada.

When the new station is ready for use, research conducted there will emphasize the rare earth minerals, some of which are radioactive, including monazite and related minerals together with such commodities as fluorspar, manganese, sulfur, talc, and tungsten. A main objective will be to increase the usable mineral reserves of the Far West.

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Shenandoah-Dives Closed

The mine and mill of the Shenandoah-Dives Mining Co. at Silverton, Colo., was shut down on February 28 because of falling metal prices, according to Charles A. Chase, executive vice-president.

The decision to close down the property was reached at a meeting of the board of directors earlier in February. The scarcity of miners in recent years denied adequate exploration and development, and now the unreasonable spread between costs and metal prices compels re-adjustment. Ore resources are excellent, and a firm program will be undertaken promptly, employing some 30 to 40 men. The work is expected to take a year or more.

Uranium Bibliography Out

The Geological Society of America published the following article in the February, 1953, issue of its *Bulletin*: "Bibliography and Index of Published Literature on Uranium and Thorium and Radioactive Occurrences in the United States. Part 1: Arizona, Nevada, and New Mexico," by Margaret Cooper of the Division of Raw Materials, U. S. Atomic Energy Commission. Since this 38-page bibliography may prove helpful to both geologists and laymen interested in uranium prospecting, the Society has prepared reprints for public sale at 25 cents per copy. Remittance must accompany orders, which should be sent to:

The Geological Society of America
419 West 117th Street, New York 27, N. Y.

Survey Banner Property

A geophysical survey is in progress on a portion of the property of the Banner Mining Co., Tucson, Ariz. The work is being done by Sherwin F. Kelly Geophysical Services, Inc., of Wilmington, Del. The Banner company holds the Mineral Hill mine in the Pima mining district, and the Copper Glance, Copper Queen, Contention and adjoining mines at Twin Buttes, seven miles south of the Mineral Hill. At the present time the company is mining about 30 tons of ore per day from the Mineral Hill, the ore coming from development work. Consideration is being given to the erection of a mill on this property.

Exploration work has been conducted at the Mineral Hill and Twin Buttes properties for more than a year under two DMEA projects. The Mineral Hill was unwatered and reopened to a depth of 700 ft and the 500, 600 and 700 levels made accessible.

The Copper Glance and Copper Queen mines were unwatered and diamond drilling is progressing underground at these two properties.

Bunker Hill Acid Plant

The Sullivan Mining Co. has set January, 1954, as a target date for completion of a large sulphuric acid converter to utilize stack gases from the zinc section at the Bunker Hill smelter near Kellogg, Idaho. A daily production of 250 to 300 tons of sulphuric acid is expected.

Tonopah Development Lease

Sinking of a winze has been started at the Tonopah Development property at Tonopah, Nev. Arrangements have also been made by the management for extensive diamond drilling from the 300-ft level of the King of Tonopah shaft. The winze will be sunk to a depth of 200 or 300 ft and further drilling conducted with the object of finding blind veins.

Drifting continues westerly on the ore-bearing vein, encountered a few months ago on the 300-ft level. The vein is now exposed for over 350 ft. Diamond drilling by Calumet & Hecla a few years ago indicated the possible existence of ore at depths of 300 to 400 ft below the present workings, and the exploration and development program currently under way is designed to test these possibilities, as well as to determine the persistence of the ore shoot found on the 300-ft level.

The extensive Tonopah Development group is controlled and operated by Homestake Mining Co. and Summit King Mines, Ltd., under lease from the Calumet & Hecla Co.

Open Texas Gypsum Mine

A new gypsum mine, 75 miles east of El Paso, Texas, has been opened by the Casner Chemical Co.

The gypsum deposit, estimated to contain a minimum of 5,000,000 tons of the powdery mineral, is being mined by open-pit methods and trucked to a railroad siding four miles from the mine.

El Dorado Chrome Co.

El Dorado Chrome Co. is preparing a large chromite deposit, south of Latrobe, Calif., for open-pit mining. The deposit is on the Chaix, Cornelius and Murphy chromite claims, which El Dorado has leased. Overburden is being stripped from the ore deposit and equipment has been installed for mining. The old Church gold mill near Placerville has been leased and is being converted to a chrome concentrator to treat ore from the new mine.

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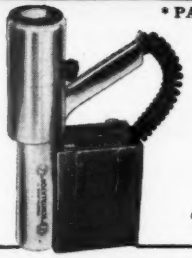

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Bingham Gaining on Butte

Oldtimer reports in the Salt Lake *Tribune* that Bingham Canyon is rapidly gaining on Butte in the race for the total value of all-time production. Butte, the "richest hill on earth," has long boasted of its greater total value of recorded output throughout the years, starting with 1882. Bingham area records go back to 1865. However, until the Utah Copper pit was conceived, it was not in the race.

According to USBM figures for 1952, Bingham's all-time recorded figure is $2,669,559,549, and Butte's is $2,915,665,120. In 1952 Bingham produced nonferrous metals valued at $175,121,304 compared with $65,430,715 for Butte.

—BOOK REVIEW—

FIELD GEOLOGY 5TH EDITION, *by Frederic H. Lahee, Ph.D., Geological and Research Counselor, Sun Oil Co. McGraw-Hill Book Co. —883 pp. Price $8.50.*

LONG recognized as an outstanding field manual, this book has undergone a thorough revision by the author. The 5th Edition includes new material on geophysics, well logging and aerial photography, magnetometry and electronic methods of location as well as a short section on underground surveying. There are four new appendixes containing tables on natural tangents, curvature and refraction corrections, lengths of degrees of parallel and meridian.

MINERAL FORECAST 2000 A.D., *by Dean Edward Steidle, E.M., D.Sc., School of Mineral Industries, Pennsylvania State College, Pennsylvania State College, 1952—216 pp.*

DEAN STEIDLE'S companion volume to Mineral Industries Education published in 1950, antedated the publication of the Report of the President's Materials Policy Commission by about six months. The report of the Commission is a review of our dependence on outside sources for many strategic and critical minerals during World War II. Dean Steidle shows how education and research can point out new directions of effort and prove that what we lack in quality resources can be offset by better brains and skills.

In his preface the author hopes that "Mineral Forecast 2000 A.D. will suggest some timely, long-range policies in the mineral field."

Dean Steidle's writing is always well worth the reading and this book may give those who have read the so-called "Paley Report" some additional food for thought.

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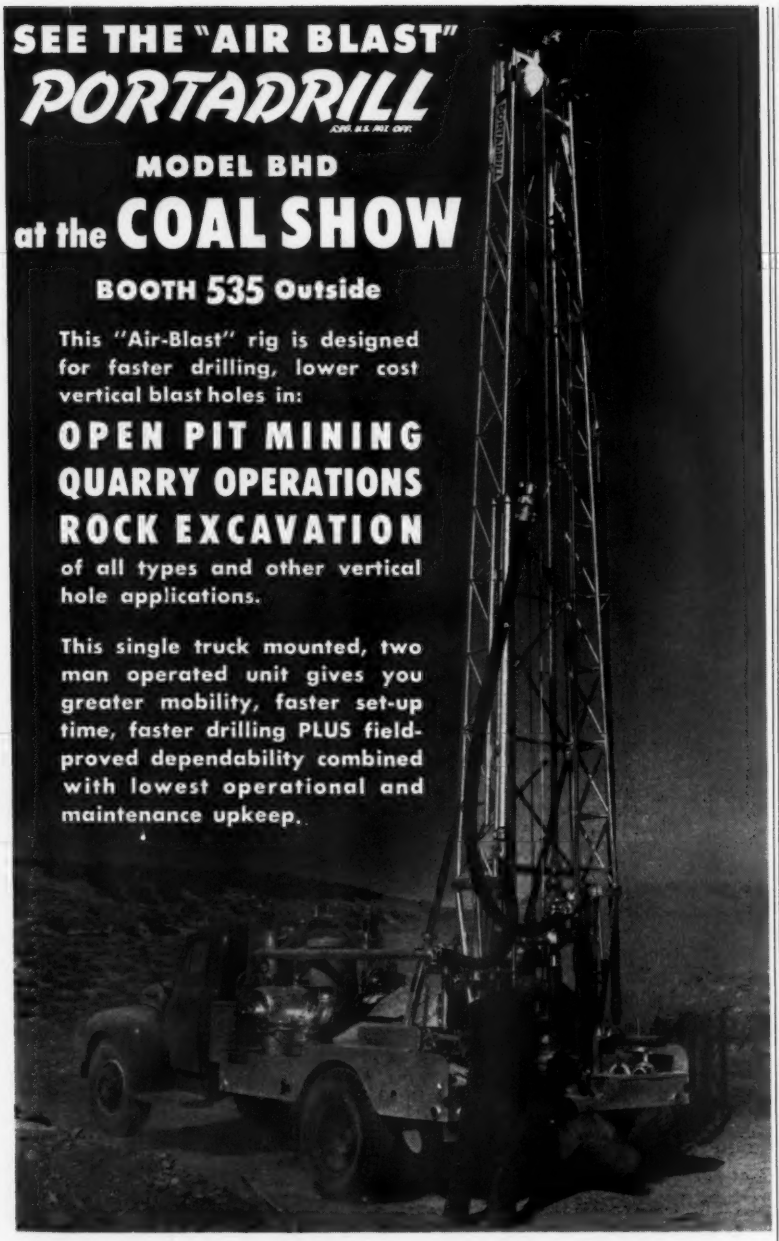

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Air Compressors

(*Continued from page* 113)

set up formal or informal classes covering all phases of compressor construction, operation, and maintenance. Such classes should be open to all interested parties, but special efforts should be made to see that the supervisory and maintenance forces attend.

Upon completion of the compressor training program, all parties involved should be brought together for the purpose of setting up a standard procedure for the care of compressors. At these sessions, responsibility should be assigned for compressor lubrication, maintenance work, stocking of spare parts, and all other essential tasks. In addition, detailed schedules should be set up for compressor lubrication and preventive maintenance work, and a set of starting and operating instructions formulated.

Correct Maintenance Pays

Without the full understanding and support of all levels of management, the program outlined above will be of very little value. It is vital that the entire supervisory force, particularly the lower levels, take an active part in all maintenance training and scheduling work. The effectiveness of such a move was clearly demonstrated recently by one large company.

Several years ago this organization purchased a number of mine car compressors for roof bolting work. From the start, maintenance costs were alarmingly high. Valve breakage, piston ring and cylinder wall wear, and intercooler plugging were all too common. At first management blamed their troubles on the compressors themselves, but as time went on the experience of neighboring companies proved that the compressors were capable of long trouble-free service. During a recent strike, a compressor training course was put on, and both mine foremen and section foremen were required to attend. The result has been that where supervision previously expected compressors to run forever without maintenance, it now takes an active interest in seeing that recommended practices are carried out. This mine no longer has any complaints about the capabilities of their air compressors.

Many mines are coming to the realization that maintenance training pays big dividends. What is true for the more common types of underground machinery is doubly true for the air compressor. You cannot expect first class performance from an air compressor unceremoniously presented to a section crew with such instructions as "It's yours, operate it and look after it." The cost of a proper presentation is low and the reward is high.

Manufacturers Forum

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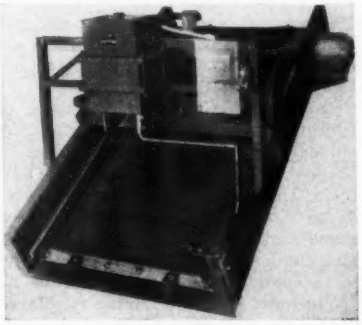
Deister Concentrator Co. has announced its latest model Leahy NO-Blind Heavy Duty Vibrating Screen and the latest design of FlexElex equipment for electrically heating the screen jacket.

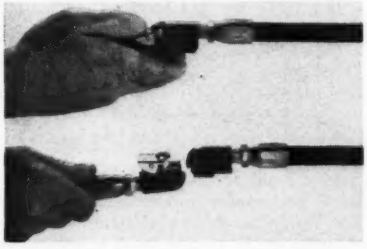
A redesigned suspension bar results



in greater flexibility in the action of the screen cloth and better vibration according to the manufacturer. A simplified method of adjusting tension and vibration of the screen cloth is also featured. For complete information write the company at Fort Wayne, Ind.

Hydraulic Couplers

Aeroquip Corp. of Jackson, Mich. has developed a new Slide Seal Coupling, according to president Peter F. Hurst, that permits instant connection



and disconnection of fluid-carrying lines by means of a simple push-pull action. The motion is similar to that used when inserting and removing a plug from an electrical outlet.

The couplings may be used with a wide range of fluids such as water, hot oil, crude and fuel oils, anti-freeze solutions, gasoline, diesel fuels, air and others. Write the company for further information.

Marion's New Magazine

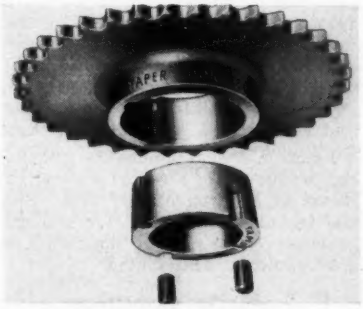
Marion Metal Products Co., Marion, Ohio, manufacturers of dump bodies and hydraulic hoists has introduced a new company publication — *Dump Body Business*. The first issue of the magazine was published in January.

The new publication is designed to fill the need for specialized news coverage of the dump body and hoist field.

Published on an every other month schedule, *Dump Body Business* is being circulated to truck dealers, contractors and others interested in dump bodies.

Reduce Sprocket Trouble

Announcement of a line of Taper-Lock sprockets and Dodge roller chain, which will be available from distributors' stocks, is made by Dodge Manu-



facturing Corp. of Mishawaka, Ind. The introduction of these new products marks the entry of this 75-year-old power transmission firm into the field of roller chain drives.

Distributors will carry in stock for immediate delivery a complete range of B-type steel sprockets, 40 to 100 pitch. Indicating the extent of the line, the range in 50 pitch, for example, is 11 to 112 teeth. All bushings and the smaller-size sprockets will be packaged individually. Chain will be packaged in 10-ft lengths and can be furnished in 50 and 100-ft reels.

Detailed information is contained in Bulletin A-624, available from the manufacturer.

Bring Out New Shovel

The first highly mobile track-type Shovel of two-yd capacity will be available in April according to an announcement from Caterpillar Tractor Co., Peoria, Ill. It will be called the No. 6 Shovel.

The new shovel will be powered by a 66-drawbar hp crawler on a non-oscillating track frame. It is an in-

tegral unit with the tractor shovel frame bolted and welded at widely separated points on the tractor engine support channels and the transmission housing. It is designed from the ground up for excellent balance and great stability.

How Are Your Shots Working!

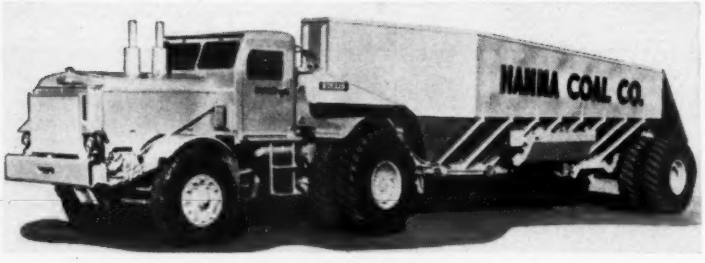
A new company has been established to take machine-gun sequence blasting photos at quarry, stripping and construction operations.

Organized as Sequence Photo Service, 705 Tatnall Street, Wilmington 1, Del., the new company is completely independent and is establishing branch offices in Chicago, St. Louis, Boston and other major cities so that assignments may be handled quickly and economically.

Sequence Photo Service is equipped with the latest style machine-gun sequence cameras and its operators are experienced in blasting work. The service makes contracts for blast photos with operating companies, seismograph organizations, consulting engineers and explosives suppliers.

Sequence blast photos have been found helpful in analyzing reasons for escaping gases, noise, certain types of breakage, and the effectiveness of various millisecond delay patterns.

Information on the new service may be obtained by writing the company.



Haul 47 Tons of Coal

A fleet of ten Euclid coal haulers of 47-ton capacity, built of special high strength alloy steel, has been delivered to the Hanna Coal Co.

To be used at Hanna's Georgetown mine near Cadiz, Ohio, the units are the largest ever built by the Euclid Road Machinery Co. The tractors are powered by 350 hp diesel engines and the trailers are built of a special manganese, nickel, copper, alloy steel. Other features include spring mounting of the trailer and use of nylon cord tires of 28 ply rating. Dual trailer and drive tires are 18 by 25.

Payload capacity is 94,000 lb or 62 cu yd struck and 70 cu yd heaped at a 3 to 1 slope.

Introduce New Loaders

Two new 4-wheel planetary drive, 4-wheel power steering front end loaders, the Scoopmobile Models LD5 and LD10, are announced by Mixer-

mobile Mfgs., 8027 N. E. Killingsworth St., Portland, Ore.

These Scoopmobiles employ a new principle of construction by hinging two power axle elements together with an oscillating twist center-pin steering coupling. This coupling allows an oscillating twist to the axles, retaining full power on all four wheels in any degree of the turning radius.

Talk Safety

Miners can avoid reading safety messages, but they can't avoid hearing them with use of the new Message-Repeater as a safety device. The newly developed unit will repeat recorded messages continuously or at desired intervals. For more powerful impact, the set can be installed to repeat its message whenever an activating device such as a photo-electric cell or a pneumatic switch is set off.

Messages are recorded by speaking into a microphone which is readily plugged into the unit, and any previously recorded messages are automatically erased when a new recording is made.

Descriptive literature is available from the manufacturer, Mohawk Business Machines Corp., 47 West Street, New York, N. Y.

New Fabric

A new industrial fabric has been developed by Thermo-plastic Fabrics Corp., 1457 Broadway, New York, N. Y., for sale under the trade name of Fortron.

Constructed of two sheets of vinyl film and a center layer of Fiberglas fabric, which are laminated together under heat and pressure to form a single sheet, Fortron is strong, lightweight, and nonabsorbent. Its makers say that it is mildew and fungi-proof, and acid, grease, and flame-resistant.

Electronic sealing makes possible the production of air- and water-tight sheets of Fortron of any size. Special techniques are used for securing grommets when use of the fabric as a tarpaulin is anticipated.

Read Distant Temperatures

The Bristol Co., Waterbury, Conn., recently announced the application of its Metameter Telemeter for use in taking remote readings of atmospheric temperature in connection with weather observation. Any distance up to 100 miles and more can be easily handled by the Metameter Telemeter according to the manufacturer.

Weigh Big Trucks

The Howe Scale Co., Rutland, Vt., announces its Four-Section Straight Lever Motor Truck Scales.

According to the company, the scale "is the modern answer to the problem of weighing big truck and trailer loads. It is designed as a companion unit to the Howe Pipe Lever Ball-Bearing Motor Truck Scale."

The new scale has a capacity of 50 tons. Platform sizes are 45, 50 or 60 ft long by 10 ft wide.

Vacuum Switch

A new, inexpensive vacuum switch that shuts off the power source when liquid supply runs dry has been announced by Jaycon Associates, 404 No. Washington Ave., Minneapolis, Minn. It is designed for use with electric motors and gasoline engines.

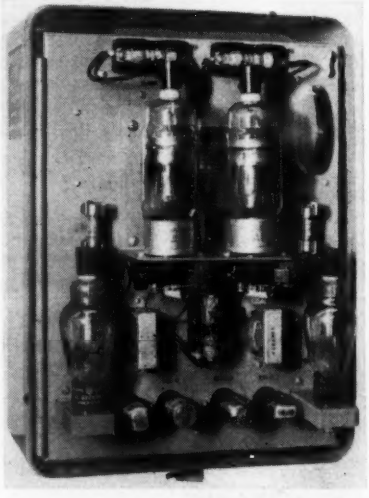
The "Vac-on" switch also serves as a warning control where operating conditions depend on a vacuum—vacuum ring in ceramics manufacture, or the protection of materials in a vacuum are cited as examples by the manufacturer.

Better Drive Speed Control

A simplified addition to its line of Thy-mo-trol packaged electronic adjustable-speed drives has been announced by the General Electric Co.'s Control Department.

Designed for use on many types of equipment, including testing machines, conveyors, variable-volume or proportioning pumps, and machine tools, the new unit is available for ¾ to 3-hp drives. It offers stepless speed-control, pre-set speed control, and close speed regulation, according to company engineers.

The new electronic drive is offered in standard speed ranges of 5:1 and



20:1, and comes in both reversing and non-reversing forms. Though less expensive than larger G-E systems, it retains many of their features, including dynamic braking and standard overload and undervoltage protection.

Selection of a wide range of speeds is accomplished by turning a single knob. The motor will accelerate to and hold any pre-set speed.

End Chain Troubles

A step in the direction of solving the old problem of machine downtime due to chain failure and replacement has been announced by Chain Belt Co. An improved, easy-to-assemble riveted roller chain does the trick —a chain combining the long-wearing characteristics of riveted roller chain and the ease of assembly and disassembly of cottered chain. Called the Improved Baldwin Assembly Riveted Roller Chain, it is being produced by the Baldwin-Duckworth Division of Chain Belt Co. and is now available through the company's distributors and district sales offices.

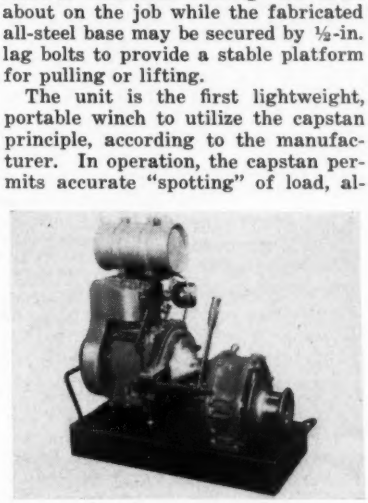
For more information, write Baldwin-Duckworth, Division of Chain Belt Co., Springfield 2, Mass.

Announce New Winch

A lightweight portable electric or gasoline-powered winch with a capstan-type drum for critical control of loads has been announced by Stampco Products, Minneapolis, Minn.

Called the "Stampco Gypsiwinch," the unit is designed as a multi-purpose hoist. Standard models are equipped with either electric or gasoline power units ranging in size from ¾ hp to 7½ hp. Two gripper type handles facilitate moving the hoist about on the job while the fabricated all-steel base may be secured by ½-in. lag bolts to provide a stable platform for pulling or lifting.

The unit is the first lightweight, portable winch to utilize the capstan principle, according to the manufacturer. In operation, the capstan permits accurate "spotting" of load, allowing the operator to "skid" the line by slacking off pressure while the capstan is rotating. Using this principle, a heavy load may be taken up and stopped very slowly, with no stress on rigging or equipment.



For further information, write Dept. KP, St. Anthony Machine Products Co., 2424 East Franklin Ave., Minneapolis 6, Minn.

—— *Announcements* ——

The **B. F. Goodrich Co.'s** industrial advertising campaign has been called "the best of 1952" and **H. E. Van Petten,** advertising manager of the company's industrial and general products division, has been named "adman of the year" by Industrial Marketing Magazine.

Ellis J. O'Brien has been appointed chief development engineer of **Heyl & Patterson, Inc.** Mr. O'Brien will direct the activities of the company's Research and Development Department. Before joining Heyl & Patterson, O'Brien was associated with the Vanadium Corp. of America.

Two new mining district offices have been established by **Mine Safety Appliances Co.** At Uniontown, Pa., **H. R. Johnson,** district manager, has his office at 303 Second National Bank Bldg. In charge of the new Johnstown, Pa., district office at 610 Johnstown Bank & Trust Co. Bldg. is **V. A. Stanton,** district manager.

Cardox Corp., Mining Division, announces that **R. O. Schoor,** who was sales engineer in Pennsylvania territory, has been transferred to Pikeville, Ky., as assistant district manager of the eastern Kentucky, Virginia and Tennessee territory. Prior to joining Cardox, Mr. Schoor was general superintendent of mines for the Warner Collieries Co. at St. Clairsville, Ohio. Before that time he was associated with J. W. Woomer & Associates, consulting mining engineers.

L. J. Ott has been elected vice-president and general sales manager of the **Ohio Brass Co.**

Stockholders of the **Indepent Pneumatic Tool Co.** have voted to change the 60-year-old corporate name to **Thor Power Tool Co.**

The **C. B. Morris Co.** with offices at Glenshaw, Pa., are now representatives in the territories of northern West Virginia, western Pennsylvania and Ohio for the **Watt Car & Wheel Co.**

Captain **A. B. Zahn,** known throughout the country to the cement industry as "Archie," is receiving congratulations from friends on his completion of 50 years of service with **F. L. Smidth & Co.,** New York.

The **Pittsburgh Screw and Bolt Corp.** announces the appointment of **Robert B. Algie** as assistant vice-president-sales. Mr. Algie formerly was assistant manager of sales of Jones and Laughlin Steel Corp., and recently was associated with Forbes Steel Corp.

CATALOGS AND BULLETINS

FUSES. *General Electric Co., Bridgeport 2, Conn.* A complete General Electric Fuse Catalog has been issued covering renewable time-delay fuses, one-time fuses, plug fuses, fuse holders, and copper link fuses. The catalog makes use of numerous illustrations and drawings. A technical data section is also incorporated in the catalog and covers such subjects as how a fuse operates, maintenance hints, excerpts from the 1951 National Electrical Code pertaining to fuses, and dimensions of fuses and fuse holders. Available upon request from General Electric at the above address.

LIDDICOAT DRILL BIT BOOK. *Calumet Div., Calumet & Hecla, Inc., 3 Calumet Ave., Calumet, Mich.* The booklet illustrates the two drilling features of Liddicoat bits, exclusive pilot construction design and sturdy attachment of bit to the drill steel. Featured are the type "L" bits for easy to drill ground and the type "H" bits for strong rock and abrasive ground. Write to the above address.

METAL MINE LOCOMOTIVES. *Goodman Manufacturing Co., Halsted St. and 48th Place, Chicago 9, Ill.* Catalog CH-521 contains information about locomotive especially engineered for metal mine service. Trolley, battery, and combination trolley and battery locomotives are described. Available at the above address.

POWER TRANSMISSION. *Twin Disc Clutch Co., Racine, Wis.* To help both the user and manufacturer of powered equipment to better understand the application of hydraulic couplings and torque converters, Twin Disc has released a 32-page special issue of *Production Road,* titled "Coupling or Converters?" The special issue is the result of many requests from persons in every type industry for an explanation as to where couplings or torque converters should be used, and why. Available at the above address.

SHOVEL-CRANE BOOK. *Link-Belt Speeder Corp., 307 North Michigan Ave., Chicago 1, Ill.* This 24-page catalog describes the 51 Series shovel-cranes of the Link-Belt Speeder Corp. Book No. 2428 is available from the advertising department of Link-Belt Speeder Corp. at the above address.

TRANSFORMER BUYER'S GUIDE. *General Electric Co., Schenectady 5, N. Y.* The 1953 edition of the G-E Instrument Transformer Buyer's Guide, containing basic, up-to-date information on the complete General Electric line, has been announced as available from the company at Schenectady 5, N. Y.

The fully illustrated, 102-page publication, GEA-4626F, contains ratings, ASA accuracy classifications, and prices of all G-E indoor and outdoor potential and current transformers. Listings of ratio and phase-angle tests, together with tables covering the mechanical and thermal limits of current transformers, are included.

VALVES. *Ledeen Mfg. Co., 1600 So. San Pedro St., Los Angeles 15, Calif.* Bulletin 1000, describing and illustrating the complete line of Ledeen Valves, is ready for distribution. The bulletin includes illustrations, operating and circuit diagrams, and dimensions and weights. Ledeen Valves, embodying disc type construction, are used for operating air and hydraulic cylinders, single and double acting, and air motors. Write to Ledeen Mfg. Co. for Bulletin 1000.

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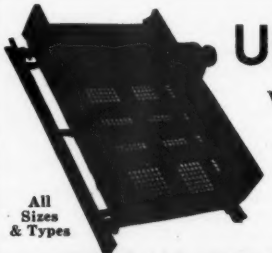
Huntington, W. Va.



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RACINE, WISCONSIN

Loader 24"-high gets bigger lumps from slim seams

. . . with help of TIMKEN® bearings

THIS 20 BU loader made by the Joy Manufacturing Company works a seam only 30 inches high. Unique features of the 20 BU loader include a gathering head with an exceptionally rugged bevel gear drive; and a conveyor pan only 18 inches above the floor which permits the passage of larger, more profitable lumps back to the shuttle car. Production capacity is 5 to 8 tons per minute.

The gathering head on the Joy 20 BU loader is equipped with 24 Timken® bearings. There are 16 other Timken bearings throughout the loader at other vital spots. Smooth, trouble-free operation is assured, even under the severest conditions.

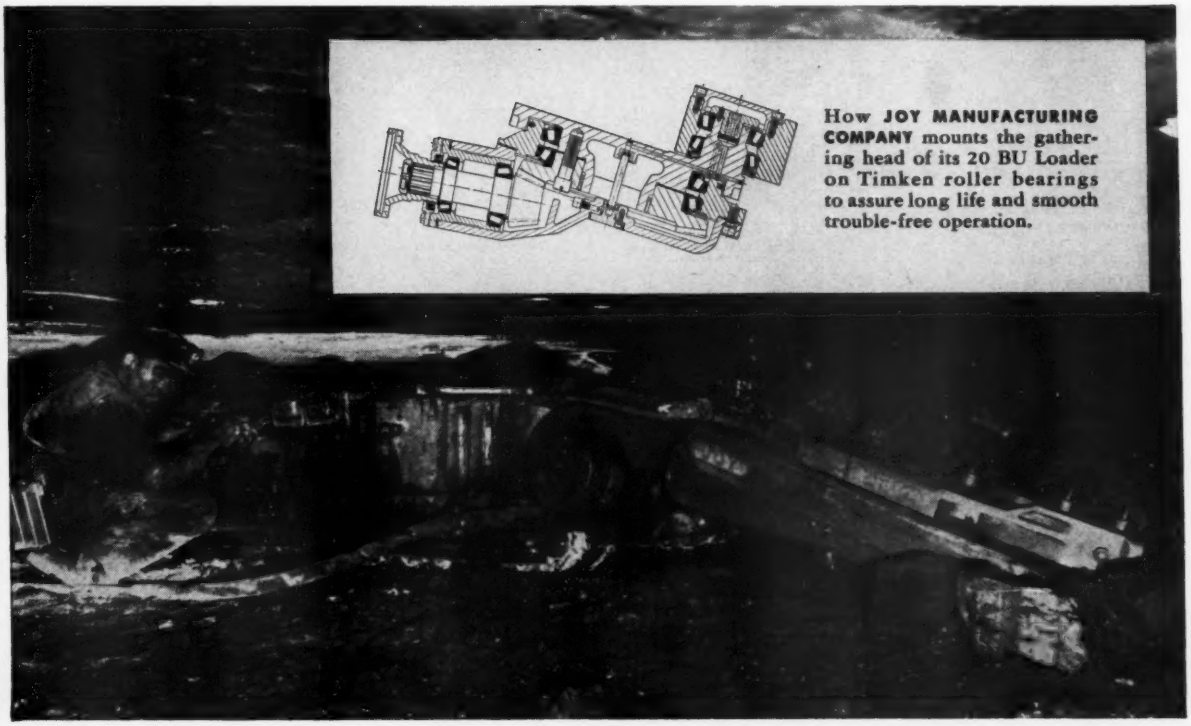
Line contact between rollers and races gives Timken bearings extra load-carrying capacity. Their tapered construction lets them carry both radial and thrust loads in any combination. True rolling motion and extremely smooth surface finish of rollers and races make friction negligible.

Because Timken bearings keep housings and shafts concentric, closures are more effective. Dirt and coal dust are kept out; lubricant is kept in. Lower maintenance and lubrication costs result.

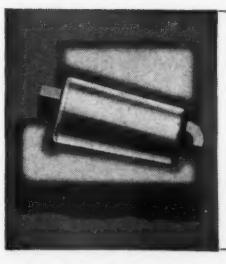
Timken bearings are case-carburized—have hard, wear-resistant surfaces and tough, shock-resistant cores. Normally, they'll last the life of the machine.

No other bearings can give you all the advantages of Timken bearings. Look for them in the machines you buy. Specify them for the machines you build. Always look for the trademark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How **JOY MANUFACTURING COMPANY** mounts the gathering head of its 20 BU Loader on Timken roller bearings to assure long life and smooth trouble-free operation.



GREATER LOAD AREA

Because the load is carried on the *line* of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer. The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

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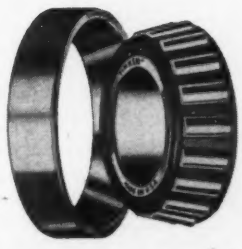
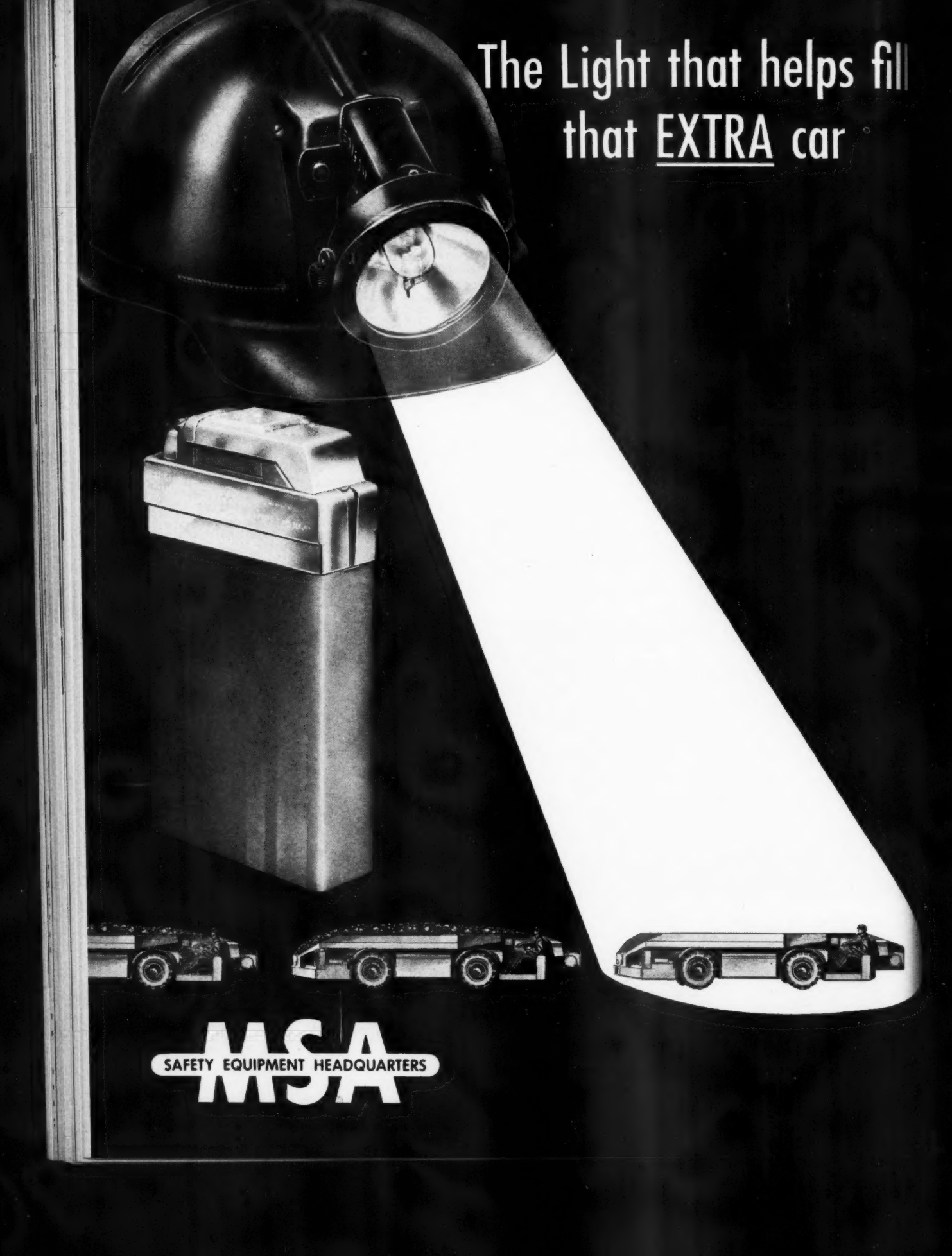
TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◎ AND THRUST →◎← LOADS OR ANY COMBINATION →✳←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